FAA Aviation News
AVIATION SAFETY FROM COVER TO COVER
NOVEMBER/DECEMBER 2003

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AVIATION SAFETY FROM COVER TO COVER

VOLUME 42 · NUMBER 6

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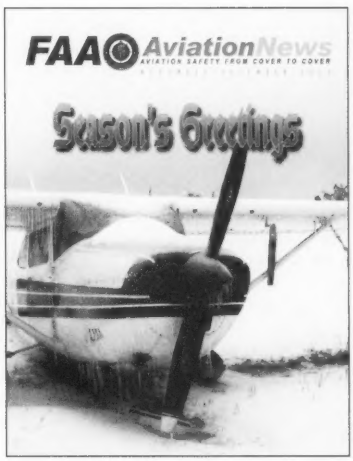


FRONT COVER and BACK COVER: These Cessnas set the appropriate mood for our wishes for a Happy Holiday Season. (H. Dean Chamberlain photos)

TFR

Airspace Obstacles and TFR Trivia

A Pilot's Guide to Understanding Restrictions in Today's National Airspace System

by Michael W. Brown

Introduction

Temporary Flight Restrictions (TFR) are tools used by the Federal Aviation Administration (FAA) to restrict aircraft operations within designated areas. Historically, TFRs have been used by air traffic management as a means of separating "non-participating" aircraft from those engaged in certain activities, such as firefighting, rescue, and law enforcement operations. They have also been used to keep aircraft away from surface-based hazards that could impact safety of flight, such as toxic gas spills or volcanic eruptions. However, over the past two years, TFRs, along with Air Defense Identification Zones (ADIZ) and Flight Restriction Zones (FRZ), have been widely used to restrict overflights through certain airspace for reasons of national security.

While TFRs may be triggered by different events, it is important that pilots familiarize themselves with each type of restriction, and how it may impact their proposed flight. Of equal importance, pilots must know how best to gain information concerning TFRs before each flight. Inadvertent flight into a TFR not only places a pilot's certificate at risk; it also increases the chances of being intercepted by military or law enforcement aircraft. Even worse, straying into TFR airspace may increase the risk of a mid-air collision.

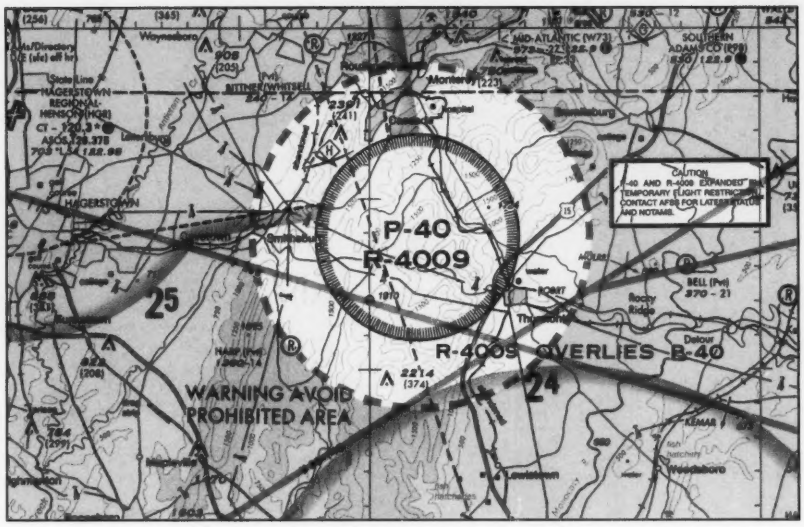
Changes in the National Airspace System

TFRs have become a topic of great interest to general aviation pilots following the events of September 11, 2001. While TFRs are nothing new, their use has grown significantly since that time. However, it is important to note that other factors have contributed to the increased number of TFRs throughout the national airspace system (NAS). One of these factors was a regulatory change that also occurred, coincidently, in September of 2001. Title 14 of the Code of Federal Regulations (14 CFR) part 91 was amended to include Section 91.145, Management of Aircraft Operations in the Vicinity of Aerial Demonstrations and Major Sporting Events. With this change, events such as air shows involving high performance aircraft or military demonstration teams, as well as major sporting events such as the Indianapolis 500™ auto race or the World Series™, may now trigger the

establishment of flight restrictions.

Another factor contributing to TFR usage has been the increasingly active forest fire seasons of recent years. While Federal agencies take great pains to limit the size and frequency of flight restrictions, the nature of their work is such that it is necessary to keep nonparticipating air traffic segregated from aircraft engaged in firefighting activities.

These factors, coupled with ongoing threats to national security, have created an operational environment that calls for greater vigilance and planning on the part of general aviation pilots.



The charted restriction around prohibited area P-40. During Presidential visits, this restriction is expanded beyond the charted limits.

TFRs in the NAS

The term "TFR" is used generically to describe various types of restrictions within the national airspace system. However, it should be noted there are actually eight types of TFRs used throughout the NAS. Understanding the reasons for each is helpful in alerting pilots to the possibility of restrictions along their intended route of flight. What follows is a brief outline of each restriction:

A flight restriction issued under the authority of 14 CFR Section 91.137, TFR in the Vicinity of Disaster/Hazard Areas, is intended to protect persons or property, on the ground or in the air, from a specific hazard. The restriction is issued to prevent low-flying aircraft from increasing that hazard, regardless of its nature. There are three situations for which a TFR may be issued under section 91.137, and they are:

1. Section 91.137a(1): TFRs are issued under this paragraph when necessary to protect persons and property on the ground or in the air from a hazard associated with an incident on the surface. Examples include: toxic gas leaks or spills, volcanic eruptions, nuclear accidents, etc.

A Section 91.137a(1) TFR is the most restrictive of any issued under section 91.137. It prohibits all aircraft from operating in the designated area, unless it is participating in disaster/hazard relief activities and is being operated under the direction of the official in charge of on-scene emergency response activities.

Pilots may have noted that a number of existing TFRs were issued under 91.137a(1) for reasons of national security. These TFRs were put in place following the terrorist attacks of September 11, 2001, to protect various Department of Defense (DoD) installations (such as military sites), chemical storage facilities, or other high-profile areas that could be targeted in future terrorist attacks. Some of the original DoD restrictions have since been cancelled, and the remaining TFRs are under review by the DoD and the FAA. The dimensions of these restrictions vary, but most are between three and five nautical miles (NM) in radius and extend upward to 3,000 or 5,000 feet above ground level (AGL).

2. Section 91.137a(2): TFRs issued under this paragraph are intended to provide a safe environment for the operation of disaster relief aircraft. Quite simply, these restrictions are meant to keep non-participating traffic away from aircraft engaged in firefighting activities, avalanche control, search and rescue activities, etc. Due to the nature of these restrictions, they may be in place for only a few hours or as long as several days. Pilots should also be aware that unlike most other TFRs, 91.137a(2) restrictions might not be circular in shape. Instead, their boundaries conform to the requirements of the agency coordinating relief activities.

Although most pilots may not fly in an area designated in a section 91.137a(2) TFR, certain exceptions are outlined. Details concerning this and other regulations may be found online at http://www.faa.gov.

3. Section 91.137a(3): TFRs issued under this paragraph are intended to prevent the unsafe congestion of sightseeing aircraft above disaster/hazard incidents of limited duration, such as aircraft accident sites, that may generate a high degree of public interest.

The restrictions in a section 91.137a(3) TFR are similar to those for 91.137a(2), except that aircraft carrying incident or event personnel may also operate in the area. For more details on use of these TFRs, including the additional information that must be included when filing a flight plan through such areas, pilots should familiarize themselves with 14 CFR Section 91.137.

4. 14 CFR Section 91.138 Temporary Flight Restrictions in National Disaster Areas in the State of Hawaii. Obviously restrictions issued under

this part do not have far reaching implications for most general aviation pilots. However, if you find yourself on the Hawaiian Islands with plans to do some flying, be on the look out for *Notices to Airmen* (NOTAMs) carrying these restrictions, particularly when a national disaster area declaration has been issued.

5. 14 CFR Section 91.141 Flight Restrictions in the Proximity of the Presidential and Other Parties. TFRs issued under this part are used to protect the President, Vice President, or other public figures while traveling throughout the United States. Prior to September 11, 2001, such restrictions were very localized and rarely impacted general aviation pilots. However, ongoing security concerns have led to restrictions much greater in size, forcing pilots to increase their awareness of Presidential movements. In many cases, Presidential TFRs with a 30 NM radius or greater have been established.

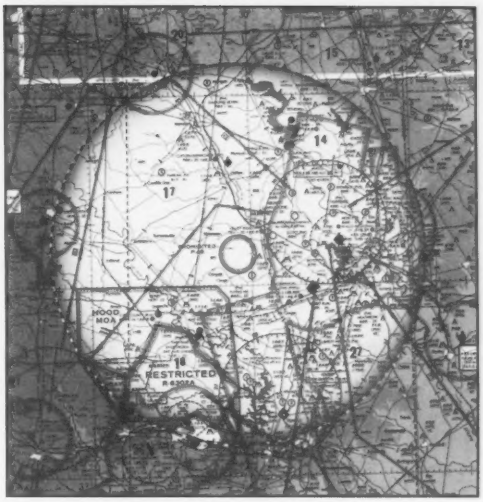
It is also important to note that pilots flying in certain parts of the country face unique restrictions associated with Section 91.141 TFRs. If you fly near Crawford, Texas, or Kennebunkport, Maine, you may expect large flight restrictions during Presidential visits. Although smaller prohibited areas (P-49 and P-67) are always in place at those locations, visits by the President may lead to the issuance of section 91.141 TFRs that impose additional restrictions. In Maryland, pilots must be aware of the airspace restrictions near Thurmont, Maryland. The Camp David Presidential retreat, surrounded by Prohibited Area P-40, is also subject to a larger (usually 10 NM in radius) section 91.141 restriction during Presidential visits. Section 91.141 TFRs typically extend from the surface up to, but not including, flight level (FL) 180.

6. 14 CFR Section 91.143 Flight Limitations in the Proximity of Space Flight Operations. These TFRs are used to provide a safe environment for space launch operations. As a result, section 91.143 restrictions are typically found in Florida, New Mexico, and California (where most such activities take place). The NOTAMs which create these TFRs usually activate existing special use airspace (restricted and/or warning areas), or airspace adjacent to these areas. Since September 11, 2001, space shuttle launches have been accompanied by additional restrictions issued under 14 CFR Section 99.7

7. 14 CFR Section 91.145 Management of Aircraft Operations in the Vicinity of Aerial Demonstrations and Major Sporting Events. When deemed necessary by the FAA, section 91.145 provides for the issuance of a TFR during certain events, including aerial demonstrations (such as those involving the Blue Angels, Thunderbirds, Golden Knights, etc.), the Olympics™, World Cup Soccer™, the Super Bowl™, etc. While section 91.145 restrictions are used in many of these instances, pilots should know that certain high profile sporting events (particularly those like the Super Bowl™ that create inviting terrorist targets), may receive larger restrictions issued under section 99.7, Special Security Instructions, if determined necessary by appropriate Federal security and law enforcement officials. Also, if the President is in attendance, the event may be covered by additional restrictions issued under section 91.141.

Generally, restrictions issued under section 91.145 encompass the minimum airspace needed for the management of aircraft operations near the event. For aerial demonstrations, the TFR will normally be limited to a five NM radius up to an altitude of 17,000 feet mean sea level (or 13,000 feet AGL for parachute demonstrations). For sporting events, the TFR will normally be limited to a three NM radius and 2,500 feet AGL.

8. 14 CFR Section 99.7 Special Security Instructions. This section allows the FAA to issue specific restrictions in the interest of national security. Prior to September 11, 2001, this section was rarely used. Since then, numerous TFRs have been established under the authority of this section. For example, TFRs have been used around cities (such as Chicago) over military facilities (such as the Navy's base in St. Marys, Georgia), and to protect space shuttle launch facilities in Florida. In other cases, section 99.7 TFRs have been issued in response to threat assessments affecting certain major sporting events, such as the World Series™; and over significant national landmarks, such as the St. Louis Arch, the Statue of Liberty, and Mount Rushmore.



(Graphic courtesy of AOPA)

The TFR surrounding Crawford, Texas. In effect during Presidential visits, this restriction can have a 30 NM radius.

Pilots must also be aware of a standing notice, issued under section 99.7, advising them to avoid the airspace above, or in proximity to, sites such as nuclear power plants, power plants, dams, refineries, industrial complexes, military installations, and other similar facilities.

In addition, section 99.7 is the basis for restrictions around certain sporting facilities (often referred to as the "Sports NOTAM"). Except for limited cases specified in the NOTAM, all aircraft and parachute operations are prohibited at and below 3,000 feet AGL within a three NM radius of any stadium having a seating capacity of 30,000 or more people in which a Major League Baseball™, National

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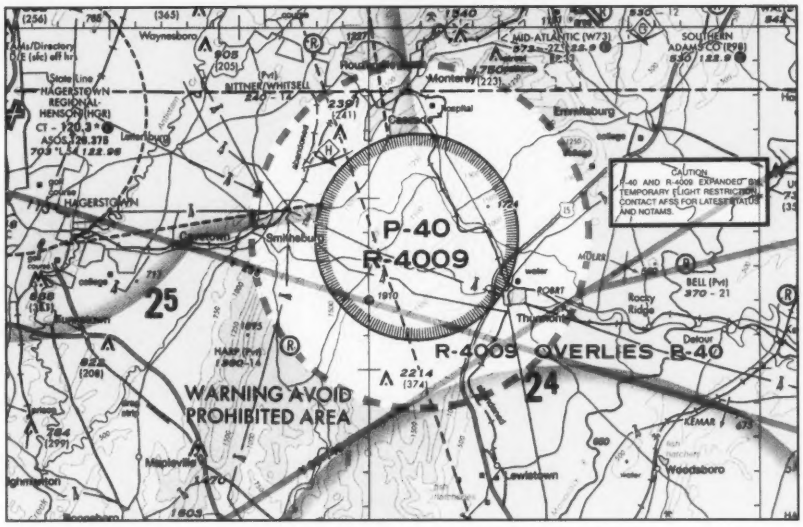

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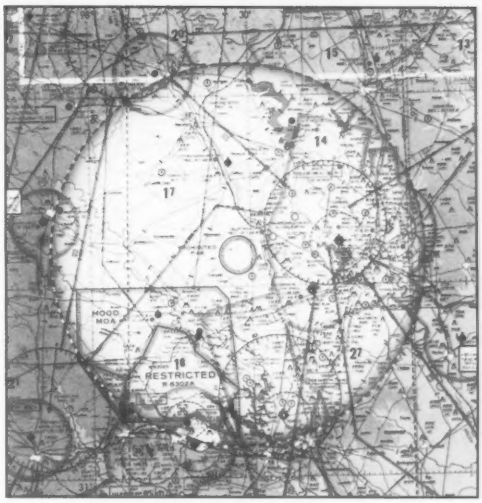

(Graphic courtesy of AOPA)

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Football League™, NCAA™ division-one football, or major motor speedway event is taking place. These restrictions are in effect one hour before the scheduled time of the event until one hour after the end of the event. All pilots should be aware that careful advance planning might be required to comply with these restrictions.

Restrictions issued under section 99.7 may vary dramatically in size, and there is no standard configuration. For space shuttle launch operations, pilots may expect restrictions with at least a 30 NM radius. Shuttle NOTAMs will also outline different operational restrictions and requirements, depending on the distance from the launch facility. Once shuttle flights resume, pilots are urged to review such notices carefully when flying near central Florida.

Flight Restrictions in the Washington, DC Area

As a result of the September 11 terrorist attacks, pilots in the greater Washington, DC area have faced a host of new operating restrictions. Due to the number of important assets in the National Capital region, flight restrictions in the DC area have changed over time in response to potential threats. There are currently three restrictions in place, the Washington, DC Metropolitan Area Flight Restricted Zone (FRZ), Special Federal Aviation Regulation 94 (SFAR 94), and the Washington, DC Metropolitan Air Defense Identification Zone (DC.ADIZ).

Washington, DC Metropolitan Area Flight Restricted Zone (FRZ)

Established for the purpose of national security, the most limiting of these restrictions has been the FRZ. The Flight Restricted Zone evolved from previous restrictions in place since December 2001. The FRZ consists of that airspace from the surface up to, but not including, FL 180, within approximately 15 NM of the Washington VOR/DME. All part 91, 101, 103, 105, 125, 135, 133, and 137 flight operations are prohibited within the FRZ, unless specifically authorized by the FAA in consultation with the Transportation Security Administration. These restrictions are also in place for pilots who wish to transit FRZ airspace. In addition to the impacts cited above, the FRZ also eliminated the popular north-south VFR flyway between Reagan National and Washington Dulles International Airports. It also narrowed the width of the southeast-northwest VFR flyway between Baltimore/Washington and Reagan National Airports. For ease of identification, this airspace is depicted on both sectional and terminal area charts. One word of caution...unlike the charted Class B airspace, FRZ restrictions extend up to, but not including, FL180. The exact description of the FRZ may be found in FDC NOTAM 3/2126

Special Federal Aviation Regulation 94 (SFAR 94)

Due to their close proximity to Washington, DC, part 91 operations were prohibited at College Park Airport (CGS), Potomac Airfield (VKX), and Washington Executive/Hyde Field (W32), for a lengthy period following the September 11, 2001 attacks. In order to restore operations at the three Maryland airports, the FAA issued SFAR 94, Enhanced Security Procedures for Operations at Certain Airports in the Washington, DC Metropolitan Area Special Flight Rules Area. Established on February 13, 2002, SFAR 94 permitted limited operations to resume for pilots based at those airports, subject to certain airport security measures, pilot background checks, and specified ATC arrival and departure procedures.

The Air Defense Identification Zone

Traditionally, the Air Defense Identification Zone, or ADIZ, has existed to facilitate the early identification of all aircraft in the vicinity of U.S. and international airspace boundaries. As such, these ADIZs existed along the coastal borders of the contiguous United States, Alaska, Guam, and Hawaii. More recently, Air Defense Identification Zones were used "inland" to protect New York City and Washington, DC. Although the New York ADIZ has since been cancelled, the Washington, DC ADIZ remains in effect.

While both types of identification zones carry with them unique restrictions and operational requirements, our focus will be the Washington, DC ADIZ. The differences between this airspace and the "traditional" ADIZ will be highlighted as appropriate. For detailed information on the latter, pilots may review the *Aeronautical Information Manual* (AIM), Chapter 5, Section 6.

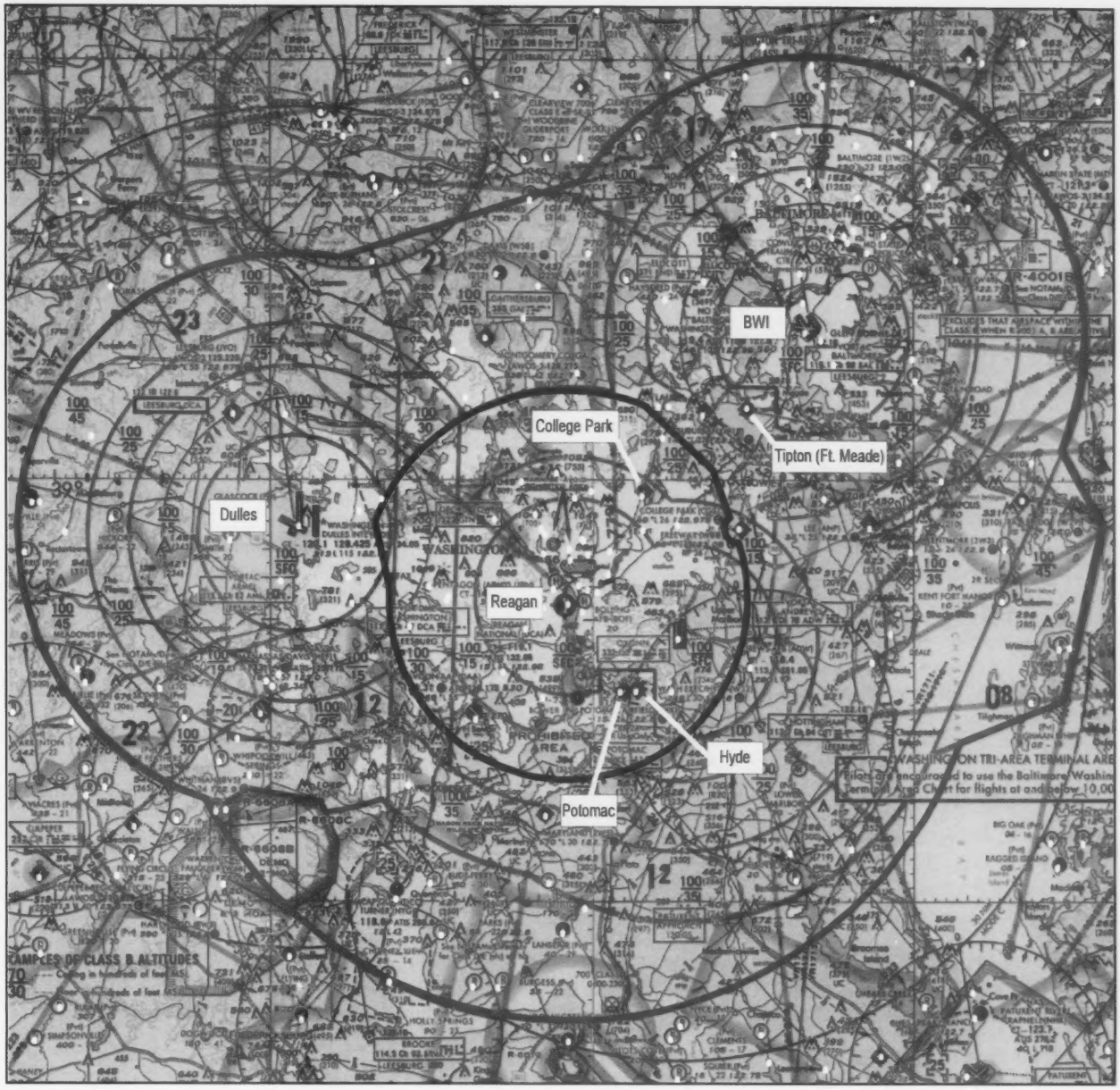
The Washington, DC ADIZ

Established by NOTAM in February 2003, the Washington, DC ADIZ extends from the surface up to, but not including, FL180. The outer boundary on the northern, eastern, and western sides of the ADIZ conforms to the outer boundary of the Washington, DC tri-area Class B airspace. An arc 30 NM in radius, centered at the DCA VOR/DME, defines most of the southern boundary.

While the exact boundary description for the Washington, DC ADIZ may be found in FDC NOTAM 3/2126, this airspace is not charted. For this reason, pilots are advised to mark this airspace on their sectional, terminal, and en route charts as needed.

ADIZ Requirements

The purpose of the Washington, DC ADIZ is to establish airspace in which the ready identification, location, and control of aircraft is required for national security. Located over land, the Washington, DC ADIZ differs from the traditional coastal ADIZ surrounding the contiguous United States, Alaska, Guam, and Hawaii (whose geographical boundaries are described in detail under 14 CFR Part 99). In addition, the requirements and procedures that apply to the DC ADIZ are unique to that airspace and differ from



The outer limits of the Washington, DC ADIZ are shown above in red. Pilot are advised this airspace is not charted. The Flight Restriction Zone, shown in black is closed to most air traffic. Unlike the ADIZ, the FRZ is charted for ease of identification.

traditional ADIZ procedures. These requirements compare as follows on Table 1, on page 7.

Pilots who intend to operate in the Washington, DC ADIZ must be aware of the following additional items:

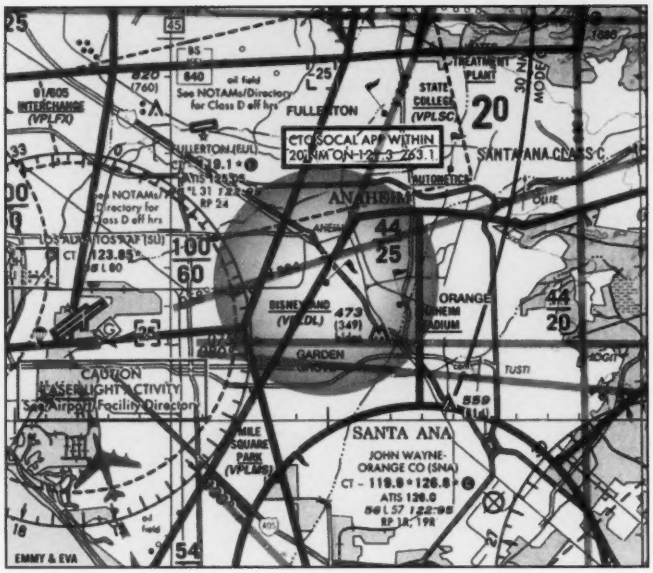
• First, clearance into the ADIZ does not constitute clearance into the Class B airspace. If your route of flight penetrates Class B airspace, be sure to get a clearance first, just as you would under any other circumstance.

• Also, the additional burden placed on air traffic controllers as a result of the ADIZ means that many VFR services are more difficult to obtain, and getting a "pop-up" clearance is often difficult (if not impossible). To avoid difficulties, file your flight plan well in advance of your departure.

• Finally, when filing your flight plan, make certain to do so using the Flight Service System. DUATS may not be used for filing flight plans within the Washington, DC ADIZ.

Decoding Temporary Flight Restrictions

TFRs are issued as Flight Data Center (FDC) NOTAMs, and may be retrieved via DUATS (http://www.duats.com) or by contacting



(Graphic courtesy of AOPA)

Because it is considered a potential terrorist target, Disneyland is protected by a security TFR issued under section 99.7.

your local Flight Service Station. Typically, the only TFRs that appear in the NOTAM publication (also known as the Class II NOTAMS) are those issued for sporting, entertainment, or other events when the time and location are known well in advance. While TFR content may vary greatly, they follow a consistent format. A better understanding of this format helps in interpreting flight restrictions. The following is an example of a typical TFR NOTAM:

!FDC 3/8925 ZOA CA. FLIGHT RESTRICTIONS WILLOWS, CA. EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE.

PURSUANT TO 14 CFR SECTION 91.137A(2) TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT WITHIN A 10 NAUTICAL MILE RADIUS OF 393400N/1224330W, THE MAXWELL/MXW/VORTAC 288 DEGREE RADIAL AT 28 NAUTICAL MILES, AT AND BELOW 8000 FT MSL TO PROVIDE A SAFE ENVIRONMENT FOR FIRE FIGHTING ACFT OPERATIONS (THE GRINDSTONE AIR ATTACK FIRE). THE U.S.F.S, PHONE 580-226-2801/FREQ 122.425, IS IN CHARGE OF ON SCENE EMERGENCY RESPONSE ACTIVITIES. OAKLAND/OAK/AFSS, 510-273-6111, IS THE FAA COORDINATION FACILITY

1. The first portion of the notice (!FDC 3/8925) indicates this is a FDC NOTAM. The number "3" indicates this notice was issued in 2003. The number "8925" is a sequential number assigned to the notice.

2. The next portion of the NOTAM (ZOA CA) informs pilots this TFR lies within airspace assigned to the Oakland Air Route Traffic Control Center (ZOA) and the restriction is found in the State of California (CA).

3. The third portion of the notice (FLIGHT RESTRICTIONS WILLOWS, CA) gives the purpose of this NOTAM. In this case, a TFR is being created in the proximity of Willows, California.

4. Next, the effective period of the notice is given. This particular TFR went into effect immediately upon issuance, and will remain in effect until it is cancelled. Most TFRs will have specific expiration dates and times.

5. The fifth section gives the authority citation for the notice. In this case, the TFR is issued under section 91.137a(2).

6. The sixth portion of the notice (TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT WITHIN A 10 NAUTICAL MILE RADIUS OF 393400N/1224300W, THE MAXWELL /MXW/ VORTAC 288 DEGREE RADIAL AT 28 NAUTICAL MILES, AT AND BELOW 8000 FT MSL) provides the location and dimensions of the TFR. This restriction has a radius of 10 NM, and extends from the surface up to, and including, 8,000 feet mean sea level.

The TFR's center point is also defined in this portion of the notice. The first set of numbers denotes the degrees of latitude (39 degrees, 34 minutes, 0 seconds north latitude). The second set provides the degrees of longitude (122 degrees, 43 minutes, 0 seconds west longitude). To help simplify things, the center point is also given relative to a navigational facility. This TFR is centered on a point 28 NM west-northwest (on the 288-degree radial) of the Maxwell (MXW) VORTAC. Pilots should be aware that latitude/longitude center points and the center points defined relative to a navigational facility do not always precisely agree.

7. The next section provides the rationale for the restriction. In this case, the TFR was issued to protect firefighting operations.

8. The eighth part of the notice provides contact information for the entity in charge of the on-scene emergency response activities. In this case, the U.S. Forestry Service is the coordinating agency.

9. Finally, the notice provides contact information (OAKLAND /OAK/ AFSS, 510-273-6111) that may be helpful to pilots. In some cases, it may be possible to operate in TFR airspace with prior permission/coordination from the controlling agency. While this NOTAM includes a telephone number, one is not always given.

Pitfalls and Helpful Strategies

Even with the many restrictions now in place throughout the NAS, it is unlikely that most pilots will find themselves in the midst of a TFR. This has led to a level of complacency, contributing to a rise in the number of violations now being investigated. In addition, certain systemic difficulties and training issues have made it challenging for even the most conscientious of

pilots to stay out of trouble. With that in mind, here are some strategies that can help you avoid TFR airspace.

First, know your area. Many security TFRs have been in place since September 11, 2001, and have changed little (if at all). If you self brief via DUATS, remember that some NOTAMs are cancelled and reissued (such as the restriction around Thurmont, MD). When a notice is reissued, it is given a new number, so don't rely strictly on a NOTAM number if you have an ongoing restriction in your flight area. In addition, when a NOTAM is reissued, the restrictions may or may not differ from those previously in place. Also, if you fly close to a national landmark, power plant, sporting facility, or military base, be particularly vigilant for restrictions that may surround those areas.

Operational Requirements	Washington, DC ADIZ	Traditional ADIZ
Flight Plan	Required. IFR or VFR	Required. IFR or DVFR. The flight plan must also be filed before departure, except for operations associated with the Alaskan ADIZ when the airport of departure has no facility for filing a flight plan.
Mode C Transponder	On and squawking assigned code	Required unless otherwise authorized
Two-Way Radio Communications	Required prior to, and while operating within the ADIZ. The only exception is for VFR aircraft operating within the airport traffic area. In these cases, the pilot is to monitor CTAF (no ATC communications are required). ATC communications and approval is required prior to leaving the airport vicinity	Required for most operations
Position Reporting	Not necessary. The pilot will be in radar and communications contact with ATC at all times within the ADIZ	Required. For DVFR flights, the estimated time of ADIZ penetration must be filed with the aeronautical facility at least 15 minutes prior to entry. In Alaska, pilots need only report prior to entry.
Airspeed Considerations	No additional considerations	When penetrating the Alaska, Guam, or Hawaii ADIZ, pilots who maintain a true airspeed of less than 180 knots are exempt from ADIZ requirements
Aircraft Markings	The size of aircraft registry marks need not be changed	12-inch registry marks are required

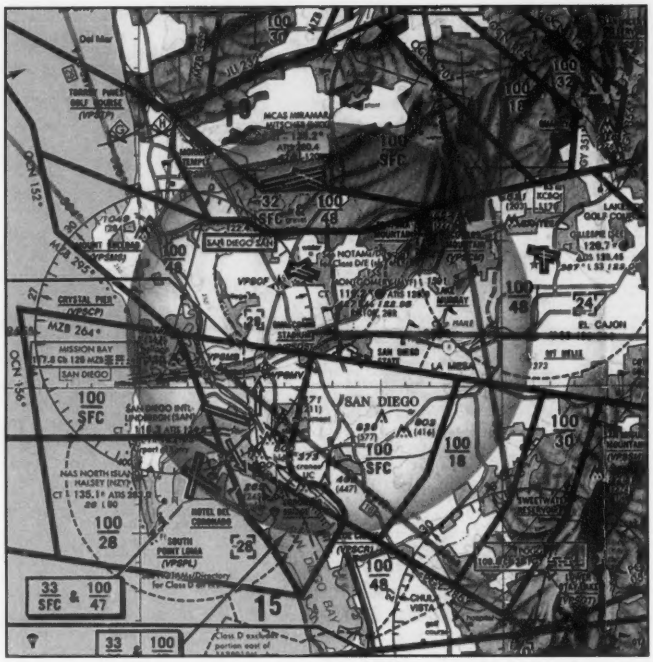
Table 1: Comparison of Washington, DC and Traditional ADIZ Requirements

Second, contact your nearest Flight Service Station and/or receive a DUATS briefing prior to EVERY flight. It is very easy to become complacent, particularly when flying in familiar airspace or over short distances. Although the FAA tries to provide advance notice when possible, actual disaster, hazard, or security situations may result in TFRs being issued, or changed, on very short notice. Also, because some restrictions are so large, even rural areas far from population centers may be enveloped by a TFR.

Next, even if you self brief using DUATS, consider giving your local Flight Service Station a call. A DUATS briefing may include many pages filled with NOTAMs, most of which are likely not applicable to your flight. As a result, an important notice may be easily overlooked. A call to Flight Service can help keep you out of trouble. Just be certain to ask for flight restrictions along your route of flight.

If there are restrictions along (or adjacent to) your route of flight, have a sectional chart handy and plot it for reference before you depart. Given the importance of avoiding these TFRs, every pilot should include a drafting compass among the items in their flight bag. This will help to accurately depict restrictions, and will hopefully keep you out of trouble. Also, when plotting a TFR, remember that even a restriction not directly along your intended route of flight may become an issue. A weather diversion, improper wind correction, or en route change of destination could easily place you in an area you intended to avoid.

When plotting TFRs on a chart, there are certain procedures that must be considered. Each time the com-



(Graphic courtesy of AOPA)

This security TFR was issued for the 2003 Super Bowl™.

pass is set to the appropriate radius, it is important to remember the scales used on each sectional chart are not precise. Also, the sectional is a graphical depiction of the surface environment, and because cartographers must take certain liberties in order to produce legible charts, objects may not be precisely where they appear on the chart. Considering these factors, if your route of flight brings you very close to a plotted TFR, it is possible that you may actually find yourself in restricted airspace, even with highly accurate global positioning system (GPS) equipment. In short, give restricted airspace a generous berth.

If it has been a while since you plotted a point on a chart using latitude/longitude coordinates, it would be wise to practice using an old chart. Even if you're off by only a few minutes or seconds, this could lead to a plot that is several miles off the mark.

Another point worth noting is that not all TFRs are the same size and shape. For example, firefighting TFRs may have an irregular shape with a large geographical "footprint." If while planning a flight you see that your course takes you near a firefighting TFR, remember that fires can spread rapidly. Be aware of the wind direction, and know that the TFR can migrate (through the cancellation and issuance of new NOTAMs), enveloping your route of flight. Even if you are far from the smoke, aircraft engaged in firefighting activities may be operating at low levels flying to and from sources of water, refueling bases, etc. If there's a chance such a TFR could impact your flight, be certain to contact Flight Service while en route for frequent updates.

Also, remember that many TFRs are in place for a specified period of time, and that time is provided (unless otherwise specified) within the NOTAM using a Coordinated Universal Time (UTC or "zulu" time) format. If you plan to fly near such a TFR, make certain the time conversion is done properly to avoid a violation.

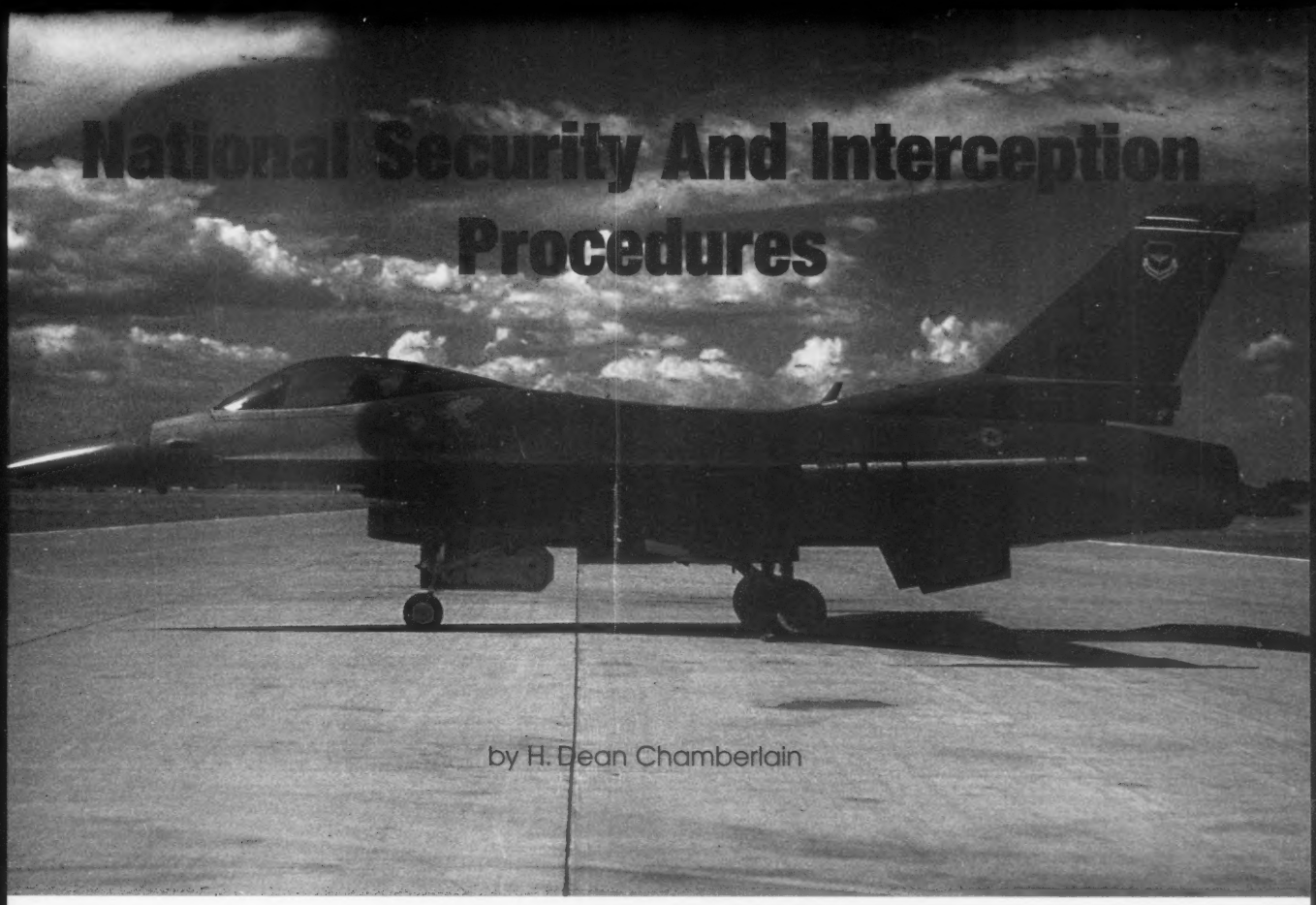
Finally, there are web resources available to help you in locating TFRs. Many can be found by using the FAA's website at http://www.faa.gov. The Bureau of Land Management also maintains a website useful in tracking firefighting and other restrictions throughout the NAS. It may be accessed at http://airspace.blm.gov/mapping/blm/index.cfm. Other non-governmental organizations have web-based resources to aid in flight planning. The Aircraft Owners and Pilots Association (AOPA) website contains links to many notices and graphical TFRs. It may be accessed at http://www.aopa.org. The Air Safety Foundation also has an excellent on-line program titled *Know Before You Go* that may be accessed at http://www.aopa.org/asf/know_before. The Experimental Aircraft Association (EAA) has teamed up with AeroPlanner at http://www.aeroplanner.com to provide graphical TFRs and other flight planning tools.

Tips such as these will help you stay clear of TFR airspace. However, to be fully prepared in case of an inadvertent TFR intrusion, pilots are encouraged to become thoroughly familiar with the interception procedures and signals contained in Chapter 5, Section 6, in the *Aeronautical Information Manual* (available on-line at http://www.faa.gov/ATpubs).

These resources, combined with sound planning and execution, will help ensure a safe, violation-free flight.

Michael W. Brown is an Aviation Safety Analyst in Flight Standards' General Aviation and Commercial Division.

Although based upon the latest Air Traffic data at the time of publication, the information in this article is subject to change and clarification. Pilots are cautioned to check for the latest material before flying. You can find the most current FAA Internet-based TFR graphics and NOTAM information at <www.faa.gov>.



National Security And Interception Procedures

by H. Dean Chamberlain

This is an updated reprint from the January/February 2002 issue of FAA Aviation News.

The above headline is not new. It is the title of Section 6, Chapter 5, Air Traffic Procedures, in the *Aeronautical Information Manual* (AIM). Paragraph two of Section 6, 5-6-2, Interception Procedures, outlines the standard, peacetime, intercept procedures that pilots can expect if they are intercepted. In light of the post-September 11, 2001, hijackings and the well-publicized interception of aircraft after that date, both air carrier and general aviation types, all pilots should review the basic intercept procedures in the AIM and the latest intercept procedures published in the current *Notices to Airmen* (NOTAMS).

Although most interceptions in the past were of aircraft penetrating the U.S., that is not necessarily true today. Although the AIM intercept procedures are those for peacetime identification of unknown aircraft entering the U.S. through an Air Defense Identification Zone (ADIZ), the procedure for intercepting any aircraft is very similar. In the case of several well-publicized air carrier intercepts, especially the airliner flying into Chicago's O'Hare airport after a passenger tried to get into the cockpit, the intercepting fighters escorted the American Airlines jet to the airport.

To put this all into perspective and since flight restrictions are becoming a fact of life, *FAA Aviation News* is reprinting excerpts from the AIM as a reminder of the recommended procedures for you to use in case you are intercepted.

Because of the dynamic nature of NOTAMS and TFRs, pilots need to review the current NOTAMS before every flight to ensure they have the latest information. In case of any doubt, contact a Flight Service Station office at 1-800-WXBRIEF for the latest information.

Because of the seriousness of the current national security situation, the following information is a verbatim copy of the intercept procedures in the AIM. We hope this information gives each pilot a better understanding of what to expect if intercepted by armed fighters. The time to wonder what two F-16 fighters are going to do next is not while they are joining on your wingtips.

5-6-2 Interception Procedures

a. General.

1. Identification intercepts during peacetime operations are vastly different than those conducted under in-

creased states of readiness. Unless otherwise directed by the control agency, intercepted aircraft will be identified by type only. When specific information is required (i.e. markings, serial numbers, etc.) the interceptor aircrew will respond only if the request can be conducted in a safe manner. During hours of darkness or Instrument Meteorological Conditions (IMC), identification of unknown aircraft will be by type only. The interception pattern described below is the typical peacetime method used by air interceptor aircrews. In all situations, the interceptor aircrew will use caution to avoid startling the intercepted aircrew and/or passengers.

b. Intercept phases (See FIG 5-6-1).

1. Phase One- Approach Phase.

During peacetime, intercepted aircraft will be approached from the stern. Generally two interceptor aircraft will be employed to accomplish the identification. The flight leader and wingman will coordinate their individual positions in conjunction with the ground controlling agency. Their relationship will resemble a line abreast formation. At night or in IMC, a comfortable radar trail tactic will be used. Safe vertical separation between interceptor aircraft and unknown aircraft will be maintained at all times.

2. Phase Two- Identification Phase.

The intercepted aircraft should expect to visually acquire the lead interceptor and possibly the wingman during this phase in visual meteorological conditions (VMC). The wingman will assume a surveillance position while the flight leader approaches the unknown aircraft. Intercepted aircraft personnel may observe the use of different drag devices to allow for speed and position stabilization during this phase. The flight leader will then initiate a gentle closure toward the intercepted aircraft, stopping at a distance no closer than absolutely necessary to obtain the information needed. The interceptor aircraft will use every possible precaution to avoid startling intercepted aircrew or passengers. Additionally, the interceptor aircrews will constantly keep in mind that maneuvers considered normal to a fighter aircraft may be considered hazardous to passengers and crews of nonfighter aircraft. When interceptor aircrews know or believe that an unsafe condition exists, the identification phase will be terminated. As previously stated, during darkness or IMC identification of unknown aircraft will be by type only. Positive vertical separation will be maintained by interceptor aircraft throughout this phase.

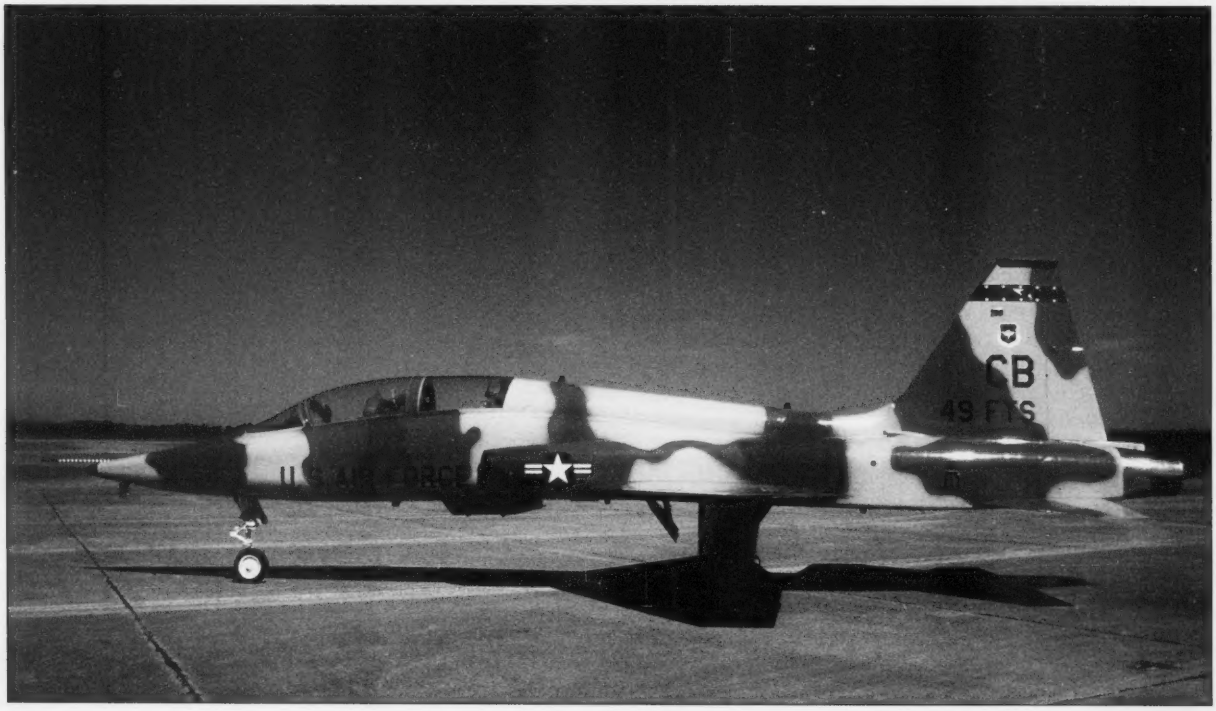
3. Phase Three- Post Intercept Phase.

Upon identification phase completion, the flight leader will turn away from the intercepted aircraft. The wingman will remain well clear and accomplish a rejoin with the leader.

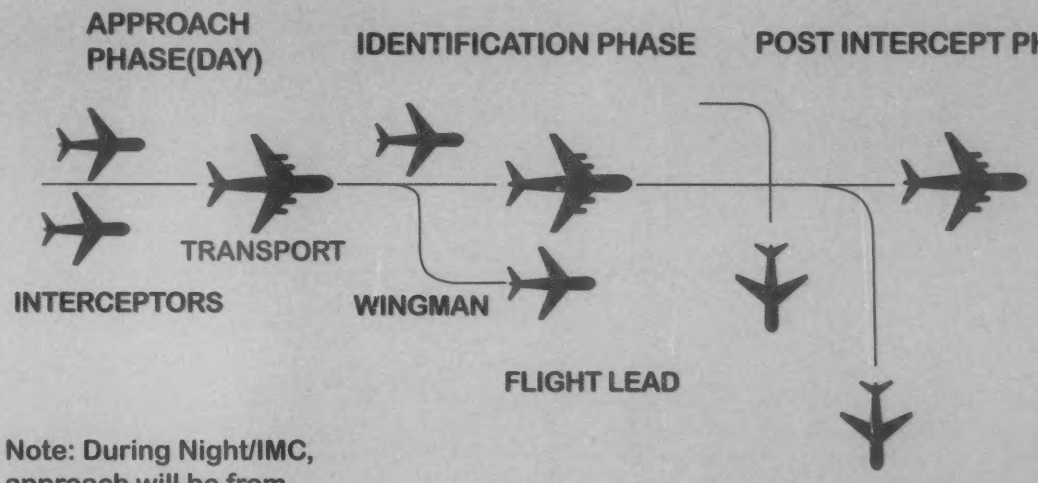
c. Communications

Communication interface between interceptor aircrews and the ground controlling agency is essential to ensure successful intercept completion. Flight safety is paramount. An aircraft which is intercepted by another aircraft shall immediately:

1. Follow the instructions given by



INTERCEPTION PATTERNS FOR IDENTIFICATION OF INTERCEPTED AIRCRAFT (TYPICAL)



Note: During Night/IMC, approach will be from below flight path.

Figure 5-6-1

the intercepting aircraft, interpreting and responding to the visual signals.

2. Notify, if possible, the appropriate air traffic services unit.

3. Attempt to establish radio communication with the intercepting aircraft or with the appropriate intercept control unit, by making a general call on the emergency frequency 243.0 MHz and repeating this call on the emergency frequency 121.5 MHz, if practicable, giving the identity and position of the aircraft and the nature of the flight.

4. If equipped with SSR transponder, select MODE 3/A Code 7700, unless otherwise instructed by the appropriate air traffic services unit. If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by visual or radio signals, the intercepted aircraft shall request immediate clarification while continuing to comply with the instructions given by the intercepting aircraft.

5-6-3 Law Enforcement Operations by Civil and Military Organizations

a. Special law enforcement operations.

1. Special law enforcement operations include in-flight identification, surveillance, interdiction, and pursuit activities performed in accordance with official civil and/or military mission responsibilities.

2. To facilitate accomplishment of these special missions, exemptions from specified sections of the Code of Federal Regulations have been granted to designated departments and agencies. However, it is each organization's responsibility to apprise ATC of their intent to operate under an authorized exemption before initiating actual operations.

3. Additionally, some departments and agencies that perform special missions have been assigned coded identifiers to permit them to apprise ATC of ongoing mission activities and solicit special air traffic assistance.

5-6-4. Interception Signals

[Table 5-6-1 and Table 5-6-2, next page]

This information is available in both the printed AIM and the FAA's Internet web site at <www.faa.gov/apubs/AIM/ index.htm>. The site contains the latest NOTAMS about flight restrictions and links to other air traffic publications.

INTERCEPTING SIGNALS

Signals initiated by intercepting aircraft and responses by intercepted aircraft (as set forth in ICAO Annex 2-Appendix A, 2.1)

Series	INTERCEPTING Aircraft Signals	Meaning	INTERCEPTED Aircraft Responds	Meaning
1	DAY-Rocking wings from a position slightly above and ahead of, and normally to the left of, the intercepted aircraft and, after acknowledgement, a slow level turn, normally to the left, on to the desired heading. NIGHT-Same and, in addition, flashing navigational lights at irregular intervals. NOTE 1-Meteorological conditions or terrain may require the intercepting aircraft to take up a position slightly above and ahead of, and to the right of, the intercepted aircraft and to make the subsequent turn to the right. NOTE 2-If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of race-track patterns and to rock its wings each time it passes the intercepted aircraft.	You have been intercepted. Follow me.	AEROPLANES: DAY-Rocking wings and following. NIGHT-Same and, in addition, flashing navigational lights at irregular intervals. HELICOPTERS: DAY or NIGHT-Rocking aircraft, flashing navigational lights at irregular intervals and following.	Understood, will comply.
2	DAY or NIGHT-An abrupt break-away maneuver from the intercepted aircraft consisting of a climbing turn of 90 degrees or more without crossing the line of flight of the intercepted aircraft.	You may proceed.	AEROPLANES: DAY or NIGHT-Rocking wings. HELICOPTERS: DAY or NIGHT-Rocking aircraft.	Understood, will comply.
3	DAY-Circling aerodrome, lowering landing gear and overflying runway in direction of landing or, if the intercepted aircraft is a helicopter, overflying the helicopter landing area. NIGHT-Same and, in addition, showing steady landing lights.	Land at this aerodrome	AEROPLANES: DAY-Lowering landing gear, following the intercepting aircraft and, if after overflying the runway landing is considered safe, proceeding to land. NIGHT-Same and, in addition, showing steady landing lights (if carried). HELICOPTERS: DAY or NIGHT-Following the intercepting aircraft and proceeding to land, showing a steady landing light (if carried).	Understood, will comply.

Table 5.6.1

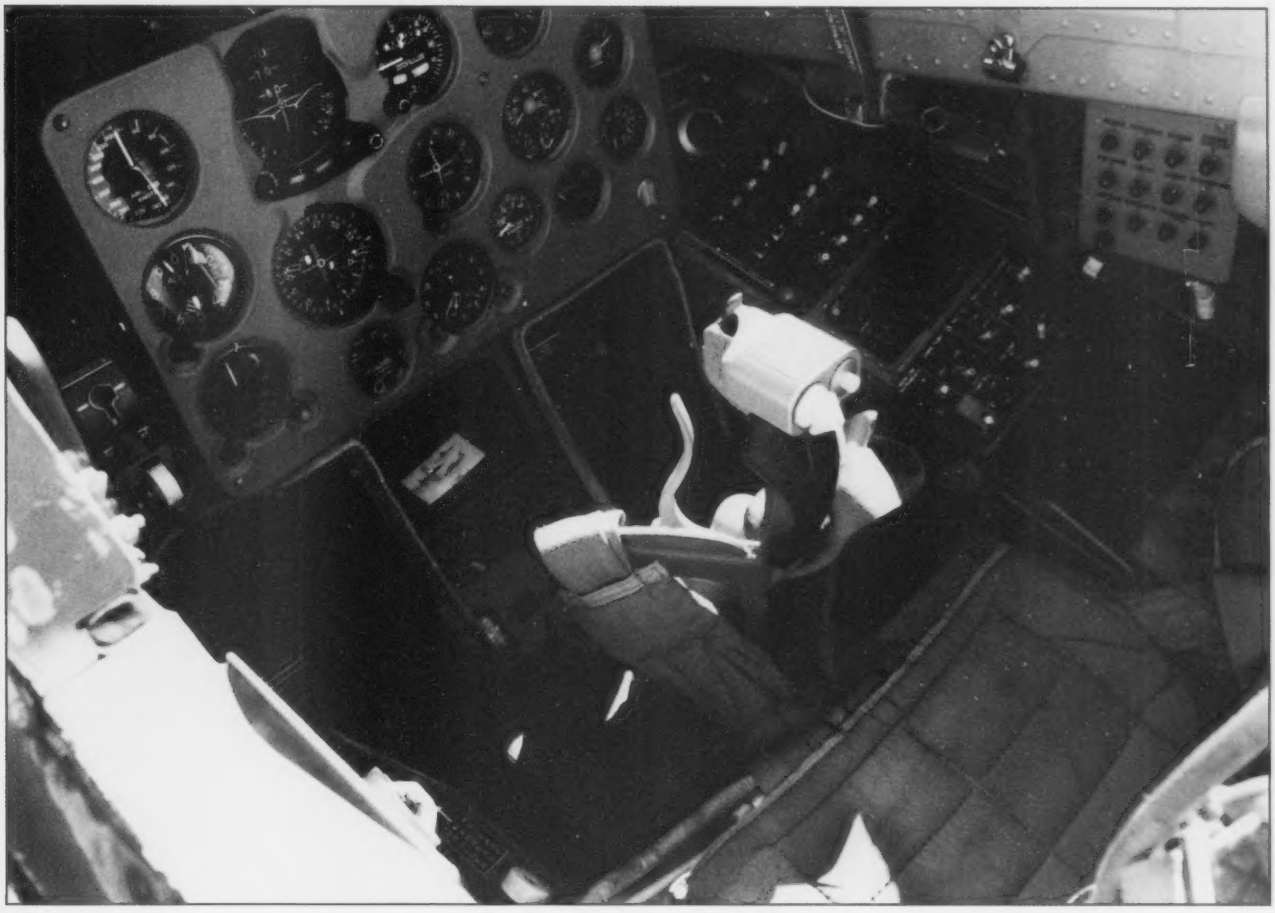
INTERCEPTING SIGNALS

Signals initiated by intercepted aircraft and responses by intercepting aircraft (as set forth in ICAO Annex 2-Appendix A, 2.2)

Series	INTERCEPTED Aircraft Signals	Meaning	INTERCEPTING Aircraft Responds	Meaning
4	DAY or NIGHT-Raising landing gear (if fitted) and flashing landing lights while passing over runway in use or helicopter landing area at a height exceeding 300m (1,000 ft) but not exceeding 600m (2,000 ft) (in the case of a helicopter, at a height exceeding 50m (170 ft) but not exceeding 100m (330 ft) above the aerodrome level, and continuing to circle runway in use or helicopter landing area. If unable to flash landing lights, flash any other lights available.	Aerodrome you have designated is inadequate.	DAY or NIGHT-If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate aerodrome, the intercepting aircraft raises its landing gear (if fitted) and uses the Series 1 signals prescribed for intercepting aircraft. If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft.	Understood, follow me. Understood, you may proceed.
5	DAY or NIGHT-Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply.	DAY or NIGHT-Use Series 2 signals prescribed for intercepting aircraft.	Understood.
6	DAY or NIGHT-Irregular flashing of all available lights	In distress.	DAY or NIGHT-Use Series 2 signals prescribed for intercepting aircraft.	Understood

Table 5.6.2

Armed And Dangerous



Anyone stepping into or reaching into this cockpit should pay attention to all of the red-colored handles and knobs. First responders need to be aware of the dangers of working in or around aircraft with armed ejection seats. Never pull or activate a red-colored handle or a yellow and black barber pole-type striped handle unless you know its function.

story by H. Dean Chamberlain
photos by Bill Kunder

Editor's Note: This is the second article in a two-part series on pyrotechnics and aircraft. The first part was about ballistic parachutes. Published in the September-October issue of FAA Aviation News, *the article was titled "Dangers of Ballistic Parachutes to First Responders."*

This second article deals with the potential dangers posed by aircraft ejection seats. Although this article is written more from a current military viewpoint, the same rules and safety recommendations apply to surplus military aircraft ejection seats. Some surplus military ejection seats may need extra care since they are older and may not be maintained as well as active-duty military aircraft. Some surplus military aircraft have had their ejection seat or seats disarmed. Other military surplus seats may be armed. Because not every surplus military aircraft with ejection seats may be armed or those with armed seats may not be marked or placarded as having armed seats, the only safe action for any first responder is to treat every aircraft having an ejection seat as being armed and dangerous.

Current U.S. military aircraft with ejection seats are armed. Most military aircraft will be marked or placarded with emergency rescue/access information.

FAA Aviation News *wants to thank Minh Venator and Bob Vallaster for all of their help and suggestions with this article.*

For those looking for help in developing guidance for responding to an off airport aircraft accident, we found a

The warning decals and markings on this jet aircraft show how to rescue the pilots as well as warning would be rescuers that the aircraft has ejection seats.

good guide published by the Australian Transport Safety Bureau (ATSB) and Directorate of Flying Safety-Australian Defense Force (DFS-ADF). The guide is titled "Civil and Military Aircraft Accident Procedures for Police Officers and Emergency Services Personnel." It is available on the following Internet web site <www.atsb.gov.au/ aviation/ handbooks/civ_mil.cfm>. Although the guide reflects Australian rules and regulations, the safety material is very good. Edition 1 is dated November 2002. Edition 2 is dated August 2003.

No, this article's title is not the description for someone on the FBI's 10 most wanted list. It is a warning for all first responders to be cautious when arriving on the scene of an aircraft incident or accident involving a military aircraft or surplus military aircraft designed with ejection seats. The normal dangers surrounding a military type aircraft accident are the risk of fire or explosion; the possible danger of burning hi-tech materials, such as composite or exotic components; the possibility of flammable or caustic fluids and fuels; and the risk of cartridge activated devices (CAD) which are fixed, pyrotechnic charges used for certain functions such as emergency activation of the landing gear, canopy, or to jettison external fuel tanks or weapon stores. There is also the added danger involving those aircraft equipped with ejection seats. The risk is the seat or seats, if armed or "hot," could activate and endanger the first responder and the person in the seat.

What I thought was going to be a simple warning to first responders about the dangers of ejection seats has become a writing challenge. In talking with Bob Vallaster, an accident investigator at the U.S. Naval Safety Center in Norfolk, Virginia, and Minh Venator of Minh Jet, a warbird maintenance and restoration company in Hollister, California, I came to realize that there is no simple answer or warning to give to first responders about ejection seats.

Just as each accident is unique, so is how to respond to each one. And just as each make and model aircraft has certain differences, so do ejection seats and their installation in those different makes and models of aircraft. Add in the potential life-threatening situation of an aircraft accident, and you can begin to see the unique challenges first responders face when arriving on scene of an accident involving aircraft with CADs or ejection seats. The question then becomes what should a first responder do when someone's life is at risk? If the first responders don't know or understand how to safely extract someone from an armed ejection seat, how

do they rescue that person without risking their own lives? Do they risk activating the seat or wait until trained personnel arrive on scene to "safety" the seat or disarm it?

Those are the questions facing first responders when they arrive on scene of an aircraft accident, and the pilot or passenger is still alive and the aircraft is on fire or at risk of exploding.

WHAT WOULD YOU DO?

In reviewing this article, Vallaster made several important comments for first responders. As he noted in his reply, "The length springs from my desire to make clear that explosive systems are a risk to any who approach them without knowledge and respect. The last three words are important; risk ramps up if either is insufficient. This message has to come out in the article, without sugar-coating."

He also wrote, "The article poses a dilemma: what can a first responder do to render needed assistance with least jeopardy? An abiding principle for first responders is that peril invites rescue. An abiding truth about powered flight is that accidents frequently involve injury, entrapment, and threat/presence of fire; so there is an urgency to evacuate aircraft occupants. In some regards, this project is like trying to write a piece which prepares a non-swimmer to be a lifeguard. Although I have concerns about generalizing varied and complex systems for a reading audience, I do not want an airman to perish for want of a rescue attempt.

"First rule: do nothing impulsively. Stay clear of seat/drogue/canopy trajectories. Do not manipulate handles, switches, or other equipment, unless you have a positive notion of the resulting response.

"Second rule: do no more than is required to rescue/protect the living. If the airman is capable of self-help, let him/her do it or follow his/her guidance. Beyond that efforts become increasingly hazardous to rescued and rescuer; unfamiliar (possibly damaged) equipment will present problems and hazards for unacquainted personnel.

"Third rule: if time permits, call for military maintenance personnel acquainted in model, for military explosive ordnance disposal (EOD), or for civilian (police) explosives personnel."

As he noted, the risks are real.

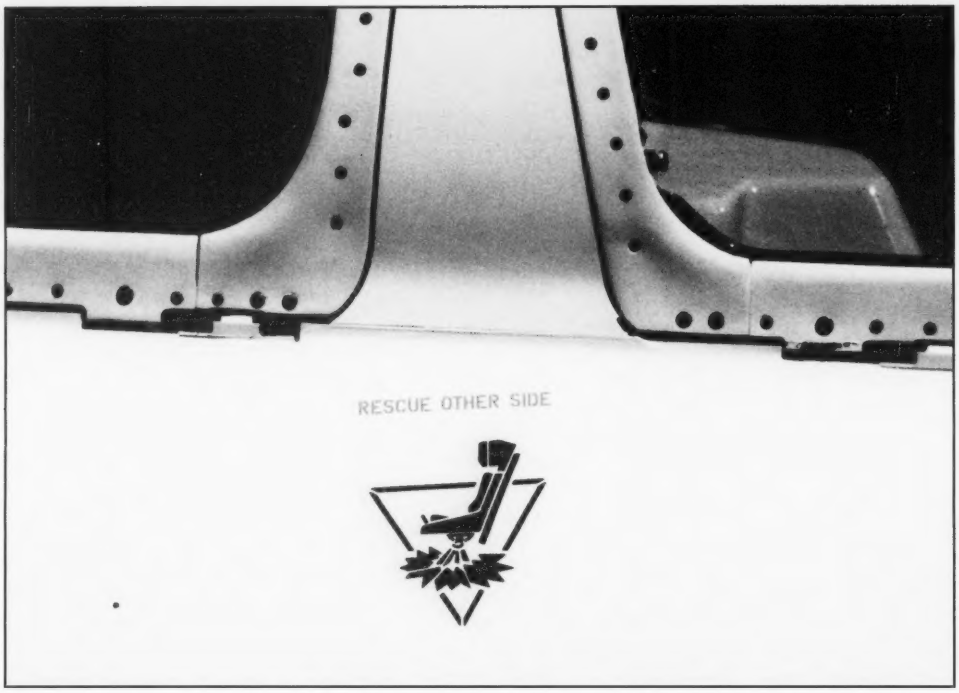
This ejection seat decal is more typical of the type of warnings on U.S. manufactured aircraft.

CURRENT U.S. MILITARY AIRCRAFT RECOMMENDATIONS

In the case of military aircraft from the Navy or Marine Corps, Vallaster wrote, "If the airman is apart from the aircraft and seat, care for the pilot and restrict access to the seat and airframe until competent help arrives. This is the least complex case (I'll call it Case 1, for consistency), involves no extrication and no urgency to tamper with unfamiliar equipment. Life becomes more complex in the next two possibilities: Case 2 is airman in seat, but out of aircraft, and Case 3 is airman and seat in aircraft. In Case 2, something is amiss (a full ejection sequence has apparently been interrupted) and the seat should be presumed to be 'hot.' For Case 3 situations, the seat (and drogue chute and canopy) should be presumed hot. Competent guidance should be sought from resources named elsewhere in the article—if time permits. In no case should anyone stand or position himself in the path of the seat (drogue chute, canopy) as it will likely fire, if activated."

He added a comment about handling airmen apart from their seat and aircraft. He said further pyrotechnics would likely be contained in an airman's harness, survival vest, and seatpack. Examples are: pencil flares, combination smoke/flare signals, SEAWARS harness separator, and life raft inflator. If an airman is incapable of removing his own equipment, the most expedient means is to cut the straps or fabric where each is thinnest, then put the gear aside while medical attention proceeds. Do not proceed to unpack or examine the gear. There is no need to do it, and it could be hazardous to doing so without any knowledge about the gear.

Vallaster highlighted the fact that if



This is one example of a warning decal for an ejection seat. The rescue other side decal is self-explanatory. Such decals provide important instructions for first responders.

the airman and seat are separated, there's no need to do anything with the seat other than fence it with barrier tape and restrict access until the pros arrive.

In his comments, he expanded the warning about cartridge-activated devices (CAD). He pointed out many seats have redundant paths for actuation to reduce the possibility of single–point failures: there can be twice as many CADs as you expect. A successful ejection can result from two impulse paths firing concurrently and consuming all their CADS, or from only one lane firing—leaving a fistful of live CADs to contend with. Discrimination requires disassembly—not a job for first responders. Conclusion: treat them all as live ordnance until the pros arrive.

If the military pilot and seat are in the aircraft, the seat is probably hot. If the pilot is conscious, the pilot may be able to provide guidance or advise to the first responders on what to do to provide help and do it safely. The pilot may be able to tell the first responders how to safely insert the safety pins to secure the seat. The pilot should know if the seat pins are stored in the cockpit. Pins might be stored elsewhere depending upon make and model of the aircraft.

If the pilot and seat are in the aircraft and the cockpit canopy is closed, first responders should look for any instructions painted on the aircraft for rescuing the pilot and how to open the canopy. The pilot may also be able to provide some guidance or help if conscious.

Vallaster made an important point about drogue or pilot chutes. As he said, pilot [chute] means leader, not crew position. Some seats use a smaller parachute to stabilize the seat during its flight; on others it may serve to extract the main parachute from its packing. Such chutes are commonly located in the "headbox" of the seat, the upper portion behind the airman's head. They are commonly deployed in this fashion: an explosive charge propels a hefty slug attached to the drogue/pilot chute. This is one of the reasons for the above caution that rescuers not position themselves in the path of seat or canopy. Roughly, a seat path is a vertical trajectory (with reference to an erect aircraft). Canopy trajectory is usually up and over the tail. Some canopies do not jettison, but shatter in place as a function of detonating cord glued in a ribbon around their edges or in a pattern across the expanse of the Plexiglas™ canopy.

If the pilot is in the seat under a closed canopy, this is another Case 3 again complicated by the canopy. The good news is that an intact canopy will likely have under it an intact (conscious) airman. The canopy is hot, as is the seat. Canopies on various models operate by different means: bungee, electrical power, hydraulic. An accident can distort or bind a canopy or can render the system inoperative. Most systems rely on a mechanical latch for final closure. Current military aircraft have placards to identify access, normal and emergency. Words like "canopy access" and "lock/unlock" apply to normal (benign) means of opening. Words like "emergency egress" or "canopy jettison" apply to explosive separation; it will work as designed, whether intended or not. Lowest common denominator: the pick end of a fire ax will break canopy Plexiglas™.

Vallaster said any first responder should read the labels and markings on the aircraft for instructions on how to rescue the pilot. He cautioned that if you have to pull on a handle located near or around the seat, you need to remain clear of the seat and its projected path out of the cockpit in case you accidentally activate it. He stressed the importance of reading all warning signs and labels. In some aircraft, handles or levers with yellow and black barber pole-type stripes or

marked in red may warn of potential danger. But his best advice was, "If you don't know what something does, you shouldn't touch or pull it."

In case a U.S. military aircraft does crash or is involved in an incident off a military airfield, first responders can contact the nearest military airfield for assistance and advice. In the case of U.S. Navy or Marine Corps aircraft, first responders can also contact the Naval Safety Center in Norfolk for assistance. That telephone number is (757)444-2929. In the case of U.S. Air Force aircraft, you should call (505)846-3777 and ask for either the Air Force Safety Center Technician or the duty officer.

Vallaster pointed out several important considerations for first responders to think about when approaching a military aircraft accident. First he emphasized that when dealing with ejection seats, a little bit of knowledge can be dangerous. He said even in the military with its training programs, accidents happen involving ejection seats because of the differences between make and model of aircraft as well as between different types of aircraft. Transient aircraft are potentially dangerous at military airfields, unless the line service people are familiar with the transient aircraft's safety systems. Because each ejection system has its own specific way of functioning and being disarmed or made safe, he could not provide a universal checklist for working around seats for first responders because of the problem that "not one size fits all."

If time permits and assuming the ejection seat is "hot", first responders should try and contact the appropriate military service for advice, if the aircraft belongs to the U.S. military. Other potential sources of information on either how to handle the seat or who to call for the information include the responders respective local or state emergency response organization, a local National Guard unit or military reserve unit, a state or metropolitan police department's bomb squad, the local Flight Standards District Office (FSDO), or the aircraft's manufacturer for directions and procedures to follow while waiting for technical assistance.

Unless there is a time critical, life-threatening situation, any first responder arriving at such an accident should following their local procedures for dealing with a hazardous situation and follow the advise or assistance by the respective military service.

SURPLUS MILITARY AIRCRAFT RECOMMENDATIONS

Since one of the most popular surplus military jet aircraft in the United States is the Czechoslovakian Aero Vodochody company's L-39 *Albatros*, we will use its ejection seat and safety features as our example of a surplus military aircraft. Minh Venator of Minh Jet said to assume all L-39 seats are hot. Unless the pilot has told you or the aircraft is placarded as having disarmed seats, you have to consider the fact the seat could activate. As we said in the first-part of this two-part series, any time an aircraft is involved in an incident or accident there is always the possibility that pyrotechnic devices could be damaged or are ready to activate if moved improperly. Since each accident or crash is different, it is impossible to tell the extent of damage or condition of an ejection seat without a detailed inspection by a qualified technician. Since first responders normally are not trained to inspect ejections seats, most will lack the knowledge and skill to determine the extent of damage to a seat after an accident.

This warning decal reminds pilots and crewmembers to remove the pins from the ejection seat before flight. If left installed, the pins would keep the seat from activating. This is why anyone working on or near an armed ejection seat should always check the status of the pins before working in the ejection path of the seat.

Although Venator said the L-39 seat is mechanically operated and very inert by itself, it could possibly activate in a cockpit fire. He said unless the pilot can confirm if the seat is hot or not, the next best thing is for first responders to be able to recognize if a seat is armed or not. If time permits, a knowledgeable person should be con-

tacted for any available safety information or procedures. Short of removing the seat and disarming it, the standard way to safety an ejection seat is to use the designated safety pins to secure it.

Since the pins may be lost or hidden in a crash and there is a high probability that a first responder will not know how to "pin" the seat, first responders are at risk when working within the cockpit area of any military or surplus military aircraft.

Although many of the same safety guidelines provided for U.S. military aircraft apply to the L-39 and other surplus aircraft with ejection seats, the L-39 and some other foreign surplus aircraft are unique because in some cases, although the aircraft's operating limitations require it, some owners may not have completely translated the aircraft's operating manuals and safety instructions into English. Add in the fact the aircraft is surplus and like similar surplus military aircraft, it is certificated as an experimental, exhibition aircraft; and you get a situation where you don't know the condition of the ejection system and how current is its maintenance or how well the system is being maintained. If the pyrotechnics have not been replaced within the specified time period, there is the possibility of an unstable device. There is also the possibility that the ejection seat and related parts have not been assembled correctly. All of which adds to the potential risk first responders face in case an L-39 crashes off an airport.

SUGGESTIONS FOR OWNERS OF SURPLUS MILITARY AIRCRAFT WITH EJECTION SEATS

- Consider placarding the aircraft with the status of the ejection seats or any onboard pyrotechnics, if not required by your operating limitations
- Consider briefing and training your local first responders on how to approach and rescue you from your aircraft, if you have not already done so in accordance with your operating limitations
- If the aircraft is relocated to a different home field for any period of time, brief the new first responders
- Consider developing a briefing card with directions and photographs on how to "safety" your ejection seat for first responders and carry the card in the aircraft where a first responder can easily see the card
- If the seat has not been disabled, ensure it is properly maintained in accordance with your operating limitations and FAA policy
* Operate the aircraft in accordance with its manuals and your airworthiness certificate limitations or authorizations to avoid becoming a statistic

SUGGESTIONS FOR FIRST RESPONDERS

- Have a plan before you arrive on the scene of an aircraft accident including how you might have to work around an ejection seat
- No smoking or using flashlights other than explosion-proof design
- Only persons needed in a rescue should be near the aircraft cockpit area
- Don't deform or damage the seats through force
- If the weather is bad, minimize the exposure of the seat to rain, snow, and other types of adverse weather
- Be aware that the some canopies use pyrotechnics to "blow" it off as part of the ejection process
- If in doubt, call the appropriate authorities or experts for help or advise
- Review what training resources are available in your area from either your local or state emergency preparedness organization or what is available through your local military airfield training organization or one of the service's safety centers
- Some aircraft have oxygen systems onboard, and some may have an oxygen bailout bottle in the ejection seat
- If someone has a surplus military jet in your area, you may want to contact that person or the local airport manager and do some training with the aircraft in case it is ever involved in an incident or accident and you have to respond
- Be aware that there may be separate handles or levers to activate the canopy and the seat and that firing one may fire the other

In summary, according to current FAA policy, "Former military TPA [turbine-powered aircraft] certificated for the purpose(s) of R&D, exhibition, or air racing, may be eligible to operate with functional ejection seats." To be able to operate an aircraft with ejection seats, the following policy requirements must be met in order to have these systems operational:

a. The applicant must provide objective evidence that the airport manager where the aircraft is base has been notified regarding both the presence of explosive devices in these systems and the planned operation of an experimental aircraft from that airport.

b. Ejection seat systems must be maintained in accordance with the manufacturer's procedures and inspected in accordance with the provisions of the FSDO-approved inspection program for the particular aircraft. The FAA will verify that there is a record entry indicating current serviceability of the ejection system, including the status of any dated shelf-life items.

c. The applicant must have provisions for securing the aircraft to prevent inadvertent operation of the jettison and/or ejection systems whenever the aircraft is parked.

d. The applicant must have provisions that provide for clear marking and identification of all explosive devices used in ejection seats, ballistic parachutes, and jettisonable systems. Aircraft markings should be applied externally and indicate that the aircraft is equipped with explosive devices. A special airworthiness certificate will not be issued before meeting this requirement.

Although FAA policy and certification require compliance with the above requirements, in any accident, the destructive forces involved may make the most benign system unstable. First responders need to be extra careful when dealing with any aircraft with explosive systems onboard. The life you save may be your own.

The World According to the ASI

Flight Review Options

By A. V. Peyus, Jr.

Okay, we all know that we need a flight review every 24-calendar months. But, did you know there are six ways to accomplish this required task? For some reason, I seem to find the only flight instructors around the country who are not aware of the various methods of meeting the requirements for 14 Code of Federal Regulations (14 CFR) §61.56, Flight review.

Everyone is familiar with the need to accomplish the flight review by the end of the 24th month from the last review to act as pilot in command of an aircraft. That is the "no brainer." What about the other five ways to meet this regulation? Ah, in there lies the rub! It seems there are flight instructors out in the "real world" who have misplaced their copies of this regulation in its entirety.

On more then one occasion this year, I have been told that I needed a flight review even though I had received a new type rating in February of this year. The last time I was told this, the instructor and I had a long "heart to heart" talk about the regulation, the intent of the wording, and the variety of means by which a pilot may meet this regulation. We went over the regulation step-by-step. Here is what we covered.

The requirements of 14 CFR §61.56 can be successfully met when a pilot has accomplished one of the following:

1. The pilot has passed a ground and flight proficiency flight review check conducted by a Certificated Flight Instructor (CFI); a Designated Pilot Examiner (DPE); or a FAA Aviation Safety Inspector (ASI), Operations, from your local Flight Standards District Office (FSDO).
2. The pilot has successfully passed a checkride under 14 CFR §§ 135.297 or 121.441 given by an approved company pilot check airman.
3. The pilot has successfully passed a checkride given by a military-approved instructor/check airman for an operating privilege.
4. The pilot has successfully passed a checkride for an aircraft type-specific aircraft rating to be added to his or her certificate.

Numbers 2 through 4 simply mean that when a pilot is taking a checkride for an additional pilot certificate or rating or is getting an aircraft-specific type rating added to his or her certificate, this satisfactory completed ride will meet the requirements of a flight review. The FAA, prior to the ride, must have approved the examiner, instructor, or check airman. Upon satisfactory completion of the checkride, the 24-calendar month clock is restarted.

5. The FAA sponsored "WINGS" program, officially known as the Pilot Proficiency Award Program as outlined in Advisory Circular (AC) 61-91H, is another great way to accomplish the requirements of the flight review. Satisfactory completion of one or more phases of the "WINGS" program since the beginning of the 24th calendar month before the month in which the pilot acts as pilot in command can be used in lieu of a flight review to meet the flight review requirement.

As part of the "WINGS" program, a pilot must attend or complete an FAA-recognized safety seminar. This may be in person or by completing an FAA recognized Internet safety seminar. The safety seminar can be sponsored by the FAA; an industry group; a local flying club; a military flying club; the local law enforcement organization; or, as in some small island communities, the local government that keeps the flying public and its citizens compatibly convivial. All that is required for those seminars not sponsored by the FAA is for the sponsor to contact the FAA in advance of the meeting to advise the Safety Program Manager (SPM) of the intended safety seminar and request the presence of the SPM from the nearest FSDO, and a supply of "WINGS" program cards. The cards are filled out with the pilot's name, date of the seminar, and a signature of the officiating aviation safety counsellor (ASC), FAA SPM, or a FAA Aviation Safety Inspector representing the SPM.

The card has lines to note

the completion of the three required training flights the pilot will or has received within the 12-month period required for each "WING" phase. Under the "WINGS" program, each pilot must receive the training specified for the pilot's type of aircraft flown.

After the card is fully filled out and signed by the instructor(s), it is then sent to your local FSDO's SPM for processing. The SPM will then issue a certificate of completion for the designated "WINGS" phase and issue the appropriate certificate and set of "WINGS" for each phase up through phase 10. Certificates only will be issued for phases 11 through 20. Please note that all required training for a phase must be completed within a 12-month period. Although a pilot may start working on the next phase of "WINGS" once one phase is completed, 12 months must pass between the date of the latest award and the processing of the next award. Again, the flight review clock will start anew with the issuance of a "WINGS" program completion certificate.

6. For the CFI, it is even more simplified. Every two years the CFI must renew his or her CFI certificate. The regulation allows the CFI to accomplish the CFI renewal in one of three ways: (a) Successfully attending a Flight Instructor Refresher Clinic (FIRC); (b) Taking a CFI recurrent checkride with a DPE or ASI Ops; (c) Proof that 80% (at least five) of his/her students, who have been endorsed for a checkride, have passed on first try. However, if the CFI selects to do a full checkride with a DPE or FAA Operations ASI, that ride will also suffice for the flight review. The flight review clock will start at the completion of the CFI renewal.

This makes it easy for the CFI's to stay current under both regulations, §61.56 for the flight review and §61.197 for renewal of flight instructor certificates. Since both have to be renewed every 24 months, it is a natural. It keeps the CFI current on regulation changes, National Airspace System, aircraft handling, instrument procedures, and basic stick and rudder flying.

No matter which method you choose as the means to comply with 14 CFR §61.56, the most important thing to remember and have accomplished is getting your logbook endorsed by the instructor, check airman, DPE, military instructor/check pilot, or ASI! No matter who it is, do not forget to get his or her signature and the correct statement for the type of checking that was accomplished. If the person has any doubt as to what the regulations require, you should refer them to AC 61-65, Appendix 1 for the recommended wording for the logbook entry for the type of ride taken.

Please remember, there are several ways available to you to stay current in accordance to 14 CFR §61.56. Make it work for you and your aviation life will become so much easier and more enjoyable.

A.V. Peyus, Jr., is an Aviation Safety Inspector with Flight Standards' General Aviation and Commercial Division.

FLIGHT STANDARDS SALUTES THE 100TH ANNIVERSARY OF THE WRIGHT BROTHERS' FIRST POWERED FLIGHT

by James J. Ballough,
Director, Flight Standards Service

We were not there 100 years ago when the Wright brothers conducted their experiments and learned to fly first their gliders and then later their first powered flights including their famous December 17, 1903, flight. Much has changed since then, but one thing has remained constant—the magic of flight.

Today, just as the Wright brothers discovered then, aviation requires careful planning, and in many cases, a methodical, systematic approach to flight to ensure the safety of both the aviator and the person on the ground. The Wrights built their own primitive wind tunnels in their Ohio bicycle shop to test their theories, and they were their own test pilots at Kitty Hawk. From those humble beginnings, American ingenuity has produced the safest transportation system in the world.

Within the Federal Aviation Administration, we in the Flight Standards Service are passionate about aviation and especially aviation safety. Promoting flight safety is the role of the Flight Standards Service. Everyday, thousands of Flight Standards safety inspectors and dedicated support employees work hard to keep the Wright brothers' dream of flight alive.

On behalf of the Flight Standards Service and all of us in aviation, I want to recognize the 100th anniversary of that first controlled powered flight on the sand dunes of Kitty Hawk and how it has changed all of our lives. "Happy anniversary Orville and Wilbur."

H. Dean Chamberlain photo of Flight Standards Service Director Jim Ballough discussing ISO.

The Flight Standards Service

Delivering Quality Services to our Customers Worldwide

by Jack O'Hare

FAA's Flight Standards Service (AFS) is taking on a big challenge over the next two years—implementing an effective Quality Management System (QMS). This endeavor includes the entire organization and conforms with the International Standard for a QMS. The implementation of a QMS will help Flight Standards focus on meeting the needs of its customers, increasing the consistency of its services, measuring its output and ability to meet the core mission and objectives, and bolster the creditability of Flight Standards internationally.

That's a fairly big challenge considering how large and diverse the Flight Standards organization is. Flight Standards promotes safety of flight of civil aircraft in air commerce by setting regulations and standards for the oversight of airmen, aircraft, air operators, air agencies, and designees. Flight Standards, part of the FAA's Regulation and Certification organization, is one of the largest segments of the FAA with approximately 4,500 employees in 110 offices worldwide. The QMS will span all headquarters organizations as well as the nine regional offices and all of the Flight Standard District Offices (FSDO).

As you can see, this is a large undertaking, but Flight Standards is moving forward. The Quality Assurance Staff (AFS-40) became ISO registered in 2001 and is leading the effort to assist other parts of the organization with training and guidance. More recently, the Regulatory Support Division (AFS-600) proved that the QMS concept could apply to a whole Division when their QMS was registered in September of 2003.

What is Quality Management?

Quality Management is all about customer focus, continual improvement, and making sure "quality" is factored into each of your processes and products. In its simplest form it involves creating a "systems approach" to ensure on-going quality throughout an organization. The concept of quality varies with the scope of each organization. Without Quality Management, it is difficult to identify if a real "system" is in place or if it is just a few dynamic individuals holding things together. Over time a standard for a quality management system was developed so that businesses could have some level of confidence that their partners and suppliers could consistently deliver quality products.

Role of the International Organization for Standardization (ISO)

The International Organization for Standardization (ISO) based in Geneva, Switzerland, is the world's developer of standards. The ISO (derived from the Greek word "isos" which means "equal") is not an international governmental body, but is really a collection of technical representatives from member nations that contribute to the development and maintenance of the international standards. The American National Standards Institute (ANSI) is the official representative of the United States to the ISO.

The ISO has established standards for nearly everything you can

imagine: the health industry, agriculture, electronics, construction, aerospace, computing technology, even the nuts, bolts, and screws that hold your automobile together. The standard for quality management system requirements is known as ISO-9001: 2000.

Before you can say that your QMS is ISO certified, you must meet all the requirements outlined in the standard. Then you have to contract with a company that is qualified to perform an ISO registration audit. This "registrar" visits your organization, reviews your documents, and interviews your staff to see if a QMS is in place and conforms to the ISO 9001:2000 standard. It is a big step getting everyone used to the idea of being open and sharing procedures and work processes with an auditor, but it pays dividends. You get an objective view of your system and then you make adjustments to continually improve. With the changes incorporated into the ISO 9001:2000 revision, it's actually a bit easier to apply the standard to a service organization.

Flight Standards' decision to adopt a QMS and become ISO certified is born out of its desire to provide excellence with its products and services. QMS is not new in the organization. As mentioned earlier, it has been adopted by AFS-40 and AFS-600, which proved its worth to the Flight Standards leadership.

Making It Happen

There is little doubt that a QMS implementation would not have started without the sponsorship and support of top management. In the case of Flight Standards, commitment isn't an issue. The Director of the Flight Standards Service, Jim Ballough, believes in the quality management concept and is willing to commit the resources to see the organization succeed. Ballough put the responsibility for managing the Flight Standards-wide QMS implementation effort into the hands of AFS-40, the first office to be ISO certified. This added responsibility for AFS-40 meant a change in focus. Manager Rich Lea transformed his team into a QMS support center for all Flight Standards offices and changed the name of the organization to the Quality Assurance Staff. Within the next two and a half fiscal years they have the task of getting all divisions and regions within Flight Standards under one quality management system.

Flight Standards is pursuing this effort because we want to be a more efficient organization, and we want to improve the products we deliver to our customers. Like every other service provider, we believe we produce a quality product, but there is always room for improvement. As more Flight Standards offices implement a QMS, customer feedback will become very important. Each office will track all customer comments through its QMS and have a process in place to ensure that those problems identified are corrected in an expeditious and efficient manner. This process dovetails well with the Customer Service Initiative recently established by Nicholas Sabatini, Associate Administrator for Regulation and Certification (AVR) that ensures feedback provided by AVR customers is addressed.

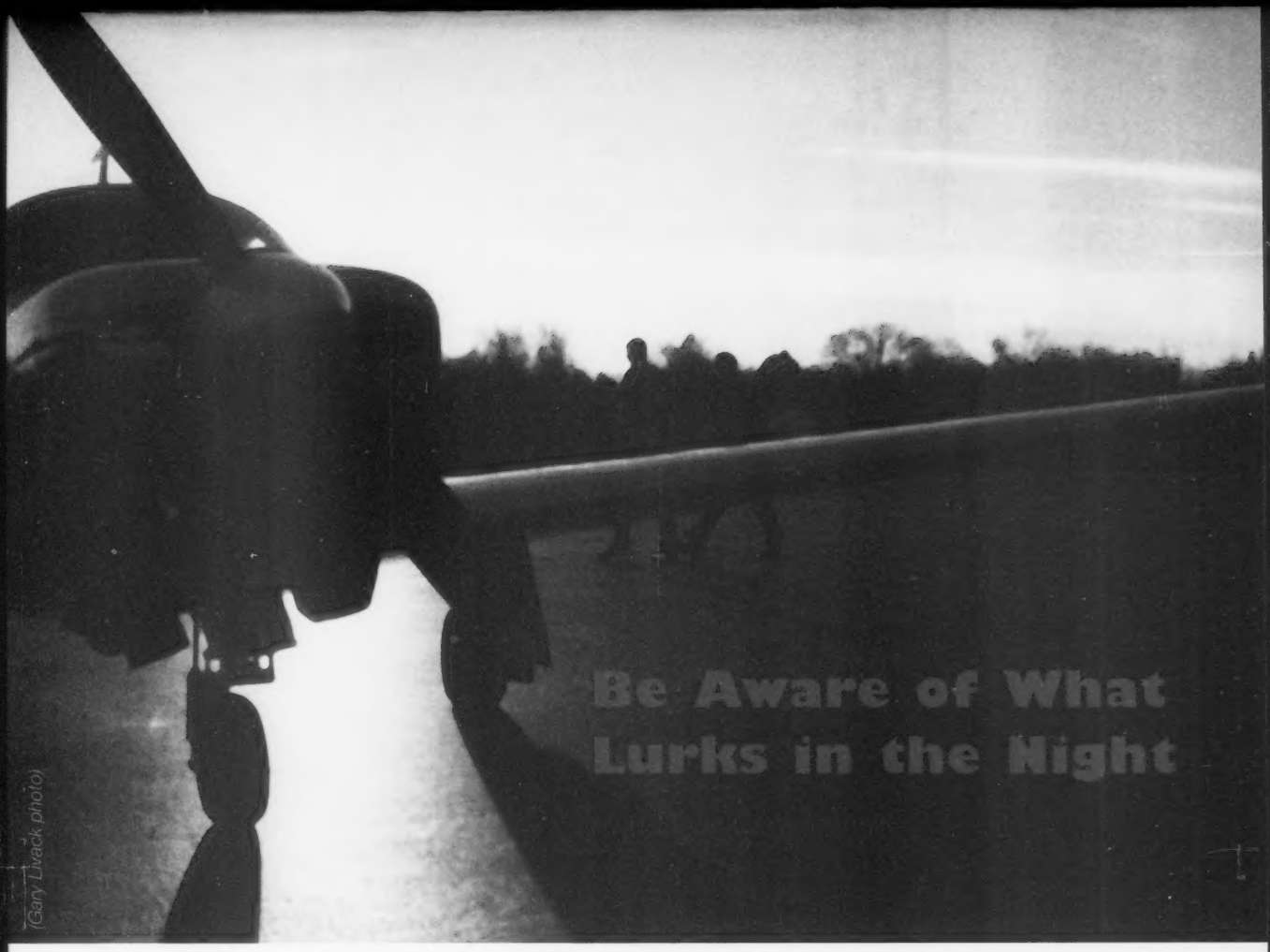
All government organizations are tasked to measure the cost of their programs against the benefits those programs provide. The ISO standard requires that same level of analysis on the products we produce as well as the processes used to produce those products. The measurement of how well our products meet your needs is a key component of our quality management system. The collection of information from various feedback sources will allow us to spot systemic problems and institute corrective measures that will not only resolve the problem but also enhance the service we provide. The great part of ISO is that it doesn't only focus on correcting existing problems. It is also focused on preventing problems that haven't occurred yet and are lurking below the radar. That is where employee involvement has its greatest impact, because typically the employees are the ones who become aware of emerging issues. Employee involvement ensures buying into the concept and provides the in-depth knowledge of the processes required to produce the Flight Standards' products. The QMS gives them a standardized process to bring issues to the attention of the organization and to correct them before the customer receives a faulty product.

Finally, we will always look for the most cost effective and timely way to provide our products and services. We are taxpayers as well and we know that you want government to spend your tax dollars as wisely as possible. AFS-600 is now positioned to operate in that manner because, after being ISO certified, a system is in place that collects quantitative information on customer requirements, analyzes that information to make decisions based on fact not conjecture, and measures the costs of meeting those requirements.

Is ISO 9001 the key to success for an organization? Well, it certainly helps, but if you take a close look at ISO, what you really see is a common sense approach towards running an organization. A successful organization, whether it is in private industry or government, typically has management that is committed to producing the highest quality product or service it can; has employees who are involved in continually improving the processes that produce those products and services; and most importantly, listens to its customers.

We have customers and they have requirements. Our challenge is to satisfy all customer requests while staying within the boundaries of our regulations. The FAA is a regulatory agency and we have Federal laws and regulations to follow, but ISO 9001 can be applied to what we do. With time and commitment, our efforts will prove that a successful QMS implementation can be achieved.

Jack O'Hare is an advisor, Quality Management, in Flight Standards' Regulatory Support Division in Oklahoma City, OK.



Be Aware of What Lurks in the Night

(Gary Livack photo)

Each year, *FAA Aviation News* looks at some aspect of winter-related flight operations as a way to remind pilots and maintenance technicians of some of the risks associated with this time of the year. In the past, we have discussed such topics as winter survival to preparing your aircraft for cold weather operations. This year, we are printing fatal accident data provided by Joe Mooney. Mooney, who works in the FAA's Office of Accident Investigation, did a computer analyses of almost 30,000 NTSB records from the period 1995-2002. He based his search upon the listed probable causes. As he said, "One accident can have more than one airplane involved, and one airplane can have more than one probable cause. So we are counting probable causes."

Mooney provided data on accidents listing both light and dark probable causes. Then he compared them to see if "dark" had any impact on the numbers. For the purpose of this report, dark includes dusk and night periods. Light includes day and dawn data. Accident data from Alaska and Hawaii are excluded. The data are pilot related. Someone had to be flying the aircraft or involved in the reported accident.

In the following data, the "Difference Factor" column is calculated by dividing the dark accident percentage by the light accident percentage. The number is an indication of the apparent increased risk factor for dark operations involving that particular phase of flight.

As you can see, some "Difference" factors are very minor. Some are more significant. Refueling, for instance, is nine times more likely to be a probable cause during dark than during light conditions. Because this is not a completely scientific study, we are only providing data to stimulate thought. But, based upon the following information, the fatal "Difference Factor" numbers seem to show that phases of flight dealing with night landings, particularly those involving instrument flight procedures are more dangerous at night.

Based upon common wisdom, the following flight profile may explain why the numbers show that phases of night landings, particularly IFR landings, have a higher fatal probable cause rating. If you see yourself in this profile, you may want to reconsider how you fly or when you fly. You have worked all day. You have flown your own aircraft or your company's aircraft on a business trip that started before sunrise. You preflighted in the dark with cold outside air temperatures. You flew several hours to your meeting. You missed lunch and ate dinner

out of the candy machine. After preflighting for your return trip in the dark, you are glad to get airborne. You spend another couple of hours airborne. You are tired and sleepy. As you prepare to fly the published instrument approach, you realize that instead of being alert and prepared to fly the procedure, you can hardly stay awake, let alone remain alert. If there is any type of wind or weather, you have just increased your risk of making a dumb mistake. Fatigue is a killer. Are you alert enough to make a safe landing? If you have ever found yourself in this situation, maybe the next time you see yourself in this accident profile, you might consider renting a hotel or motel room and spending the night. Based upon Mooney's work, you can reduce your odds of dying by several factors by waiting and departing during the daylight hours the next day. Or, if you don't want to spend the night, you could take another pilot along with you who could fly the return leg of your trip. You just need to make sure the pilot gets to rest or gets some sleep before the return trip. What you don't need is two very tired and sleepy pilots shooting an approach. You might even take an air carrier flight and leave the flying to them. Have a safe holiday period. Hope to see you next spring.

Percent of Accidents by Probable Cause Phase of Flight for Fatal GA Accidents

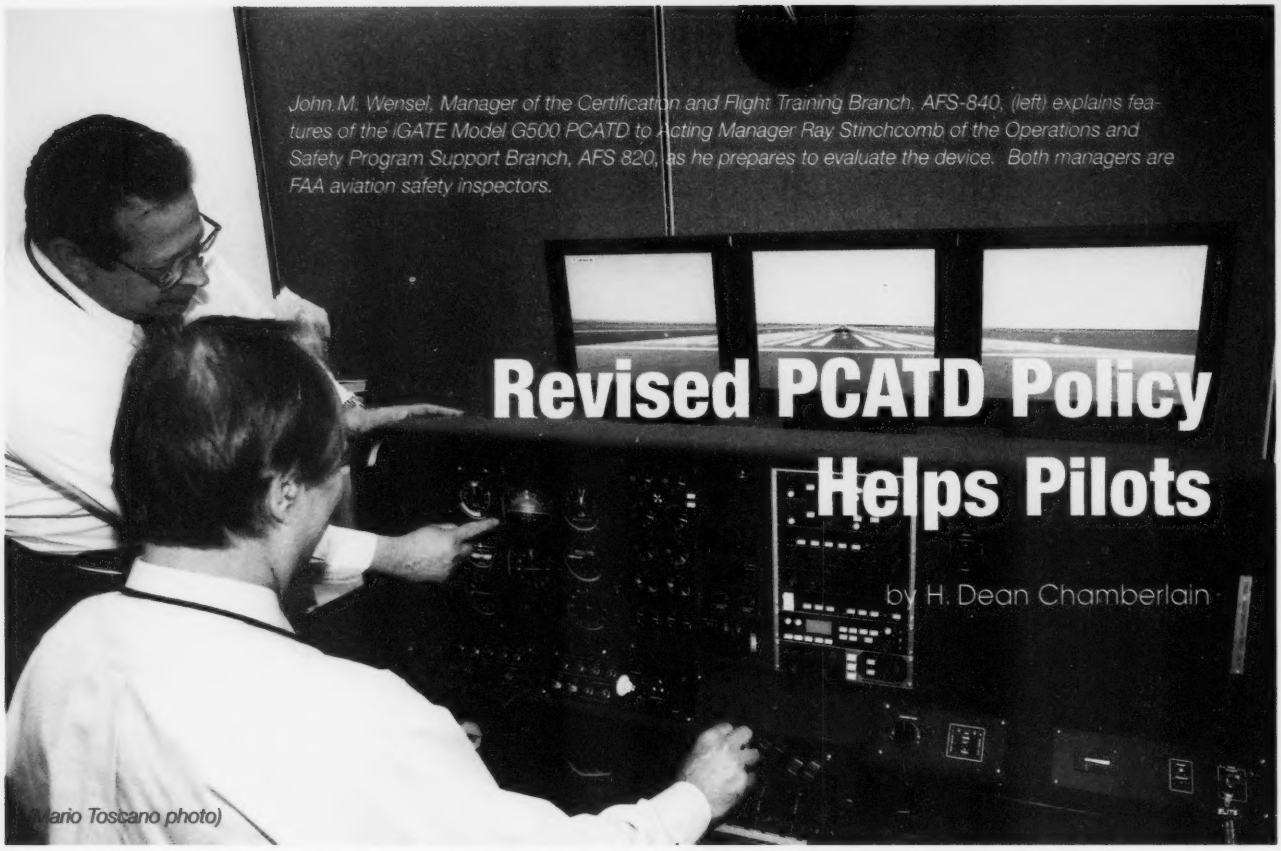
1995-2002

Probable Cause	% of All Light Accidents	% of All Dark Accidents	Difference Factor
Missed Approach (IFR)	0.6%	2.3%	4.1
Circling (IFR)	0.2%	0.5%	2.5
Approach Group	10.5%	18.1%	1.7
Descent Group	6.4%	9.4%	1.5
Cruise Group	19.1%	25.9%	1.4
Standing Group	0.6%	0.8%	1.2
Taxi Group	0.1%	0.2%	1.1
Unknown	2.9%	2.4%	0.8
Maneuvering Group	30.3%	21.7%	0.7
Climb Group	5.3%	3.8%	0.7
Takeoff Group	14.5%	10.0%	0.7
Go-around (VFR)	1.6%	1.1%	0.7
Other	0.3%	0.2%	0.6
Emergency Group	3.6%	2.0%	0.6
Landing Group	3.1%	1.7%	0.5
Hover Group	0.9%	0.2%	0.2

NOTE: The following explains what is included in the phase of operation groups indicated above.
Approach - IAF to FAF/outer marker (IFR), FAF/outer marker to threshold (IFR), circling (IFR)
Descent – normal, emergency, uncontrolled
Cruise – normal
Standing - pre-flight, starting engine(s), engine(s) operating, engine(s) not operating, idling rotors
Taxi - pushback/tow, to takeoff, from landing, aerial
Maneuvering - holding(IFR), aerial application, turn to reverse direction, turn to landing area (emergency)
Climb – to cruise
Takeoff - roll/run, initial climb, aborted
Emergency landing, landing after takeoff, descent/landing
Landing - flare/touchdown, roll, aborted
Hover - in ground effect, out of ground effect

Pilot Error Probable Cause of Fatal Accidents, 1995-2002 Sorted by Dark As a Percent of Light

Probable Cause	% of All Light Accidents	% of All Dark Accidents	Difference Factor
Refueling	0.07%	0.64%	9.0
Became Lost/Disoriented	0.11%	0.85%	8.0
Proper Glidepath	0.14%	1.06%	7.5
Decision Height	0.07%	0.53%	7.5
Reason for Occurrence Undetermined	0.04%	0.21%	6.0
Missed Approach	0.14%	0.74%	5.2
Removal of Control/Gust Lock(s)	0.07%	0.32%	4.5
Proper Altitude	0.39%	1.70%	4.3
Minimum Descent Altitude	0.35%	1.38%	3.9
IFR Procedure	0.74%	2.86%	3.8
Climb	0.14%	0.53%	3.7
Impairment (alcohol)	0.35%	1.06%	3.0
Distance/Altitude	0.28%	0.85%	3.0
Lack of Recent Instrument Time	0.07%	0.21%	3.0
VFR Procedures	0.07%	0.21%	3.0
Altimeter	0.04%	0.11%	3.0
Hazardous Weather Advisory	0.04%	0.11%	3.0
Incapacitation (loss of consciousness)	0.04%	0.11%	3.0
Instructions, Written/Verbal	0.04%	0.11%	3.0
Planned Approach	0.04%	0.11%	3.0
Stolen Aircraft/Unauthorized Use	0.04%	0.11%	3.0
Unsafe/Hazardous Condition	0.04%	0.11%	3.0
Wake Turbulence	0.04%	0.11%	3.0
Wrong Engine Shutdown	0.04%	0.11%	3.0



John M. Wensel, Manager of the Certification and Flight Training Branch, AFS-840, (left) explains features of the iGATE Model G500 PCATD to Acting Manager Ray Stinchcomb of the Operations and Safety Program Support Branch, AFS 820, as he prepares to evaluate the device. Both managers are FAA aviation safety inspectors.

(Mario Toscano photo)

Revised PCATD Policy Helps Pilots

by H. Dean Chamberlain

In a letter dated September 12, 2003, to Elite Simulations Solutions the FAA expanded the role of one of that company's computer-based aviation training devices in pilot training and currency. The company's iGATE Model G500 series personal computer-based aviation training device (PCATD) can now be used for more creditable hours towards an instrument-rating course as well as for meeting other rating and currency requirements of Title 14 Code of Federal Regulations (14 CFR) parts 61 and 141.

To better understand the importance of this expanded role for the G500 series, you need to know and understand the history and evolution of PCATD's in pilot training. The FAA's Larry Basham, a Flight Standards Aviation Safety Inspector, started evaluating such devices in about 1981. At that time, some enterprising entrepreneurs were attempting to develop flight-training devices based upon the then emerging personal computers. One major problem was those early attempts to develop a PCATD failed to replicate the basic functions of a training aircraft with enough fidelity to provide a meaningful transfer of learning. For example Basham said, "No small general aviation aircraft was using a computer mouse or keyboard to fly, but some manufacturers submitted PCATD's for evaluation with those type control inputs. Add in unrealistic controls and displays and you can begin to see why those early attempts at building a successful FAA recognized PCATD failed."

FAA continued monitoring the development of personal computer based training devices. In 1991, FAA started developing an advisory circular (AC 61-126) on PCATD's. In 1997, AC 61-126 was released. In it, FAA outlined the minimum standards or concepts that a prospective PCATD manufacturer needed to meet to gain FAA's approval. The AC said FAA would grant 10 hours of training credit towards an instrument rating for approved devices. To receive this 10 hours of credit, the applicant had to use an FAA-approved PCATD configuration replicating a generic general aviation aircraft with all of its approved components and approved software version along with an authorized instrument instructor, flight or ground, in an integrated flight and ground instrument rating course.

Some of those early PCATD's submitted to FAA for approval continued to be rejected for many reasons. Basham said some were rejected because the device was not realistic, others had indicators that were difficult to see and interpret, some had bad panel layouts, and some had stepping problems. According to Basham, stepping is where the computer image or indicators move in detectable steps or jumps rather than in a smooth motion like in an aircraft. He said unacceptable scan patterns and poor control layouts were other problems. The reality was that many of those early PCATD units submitted for FAA review

(Mario Toscano photo)

John M. Wensel (left) discusses the latest PCATD policy change with Aviation Safety Inspector Larry Basham. Basham is the FAA's lead inspector working with personal computer-based aviation training devices.

simply failed to replicate a basic general aviation aircraft.

However in 1997, the FAA approved the first PCATD's for use in pilot training. One of those would evolve into the iGATE Model G500 series advanced PCATD. Flight Standards' Certification and Flight Training Branch, AFS 840, carefully reviewed and tested the device to see how well it functioned. After weeks of evaluation by both FAA Aviation Safety Inspectors and other pilots, the Branch's manager, John Wensel, agreed that the G500 PCATD was realistic enough to expand the training credit that could be given in the device. Wensel increased the number of hours permitted in a basic PCATD from 10 hours of credit in an integrated flight and ground instrument training course to two and a half hours of credit for use in a private pilot course, 20 hours of credit in an instrument training course, 50 hours of credit in a commercial course, and to 25 hours of credit for an ATP rating. Since these hours are non-cumulative, a student pilot working towards an airline transport pilot certificate could log 97.5 hours in an approved G500 over the course of acquiring those ratings. In addition, the G500 can be used to maintain instrument currency as well as for a portion of an instrument proficiency check. Since the G500 advanced PCATD has no landing credit, it cannot be used to fully meet the instrument proficiency check requirements.

From the early days when FAA was deciding on what to call PCATD's, Basham said proposed names included training aid to training device and finally PCATD. FAA and the PCATD manufacturers have worked together to provide the most realistic training possible using PCATD's. The rapid advancement in glass cockpits and other electronic improvements in general aviation aircraft, including the smaller, general aviation training type aircraft will challenge the PCATD manufacturers and FAA to keep up. FAA will continue to develop its PCATD evaluation process based upon the needs of the aviation community. For example, the material in AC 61-126 is being updated and will become part of the FAA/Industry Training Standards (FITS) documentation as that material continues to be developed. PCATD's continue to improve and the expanded hours authorized in the G500 series PCATD are proof of the development. Today, the G500 series sets a new standard for PCATD use in pilot training. Only the future will reveal what will happen next in the exciting PCATD community.

(Mario Toscano photo)

Ray Stinchcomb prepares to "fly" the iGATE Model G500 PCATD as part of its FAA evaluation.

photo by John T. Daniels, 1903

How We Made the First Flight

by Orville Wright

This is only a portion of Orville Wright's own account of the world's first powered, sustained, and controlled flight. The article was published ten years after the Wright brothers had made that first flight, appearing in the December 1913 issue of the American aviation journal, Flying *and* The Aero Club of America Bulletin. *Because of the significance of this primary account of the events and activities surrounding that epochal achievement, it is reprinted in its entirety on FAA's Aviation Education web site* <www.faa.gov/education/wright/wright.htm>.

The flights of the 1902 glider had demonstrated the efficiency of our system for maintaining equilibrium, and also the accuracy of the laboratory work upon which the design of the glider was based. We then felt that we were prepared to calculate in advance the performance of machines with a degree of accuracy that had never been possible with the data and tables possessed by our predecessors. Before leaving camp [Kitty Hawk] in 1902 we were already at work on the general design of a new machine which we proposed to propel with a motor.

FLIGHT TESTING

We left Dayton, September 23, and arrived at our camp at Kill Devil Hill on Friday, the 25th. We found there provisions and tools, which had been shipped by freight several weeks in advance. The building, erected in 1901 and enlarged in 1902, was found to have been blown by a storm from its foundation posts a few months previously. While we were awaiting the arrival of the shipment of machinery and parts from Dayton, we were busy putting the old building in repair, and erecting a new building to serve as a workshop for assembling and housing the new machine.

Just as the building was being completed, the parts and material for the machines arrived simultaneously with one of the worst storms that had visited Kitty Hawk in years. The storm came on suddenly, blowing 30 to 40 miles an hour. It increased during the night, and the next day was blowing over 75 miles an hour. In order to save the tar-paper roof, we decided it would be necessary to get out in this wind and nail down more securely certain parts that were especially exposed. When I ascended the ladder and reached the edge of the roof, the wind caught under my large coat, blew it up around my head and bound my arms till I was perfectly helpless. Wilbur came to my assistance and held down my coat while I tried to drive the nails. But the wind was so strong I could not guide the hammer and succeeded in striking my fingers as often as the nails.

The next three weeks were spent in setting the motor-machine together. On days with more favourable winds we gained additional experience in handling a flyer by gliding with the 1902 machine, which we had found in pretty fair condition in the old building, where we had left it the year before.

Mr. Chanute and Dr. Spratt, who had been guests in our camp in 1901 and 1902, spent some time with us, but neither one was able to remain to see the test of the motor-machine, on account of the delays caused by trouble which developed in the propeller shafts.

CHANUTE'S EXPERIENCE

While Mr. Chanute was with us, a good deal of time was spent in discussion of the mathematical calculations upon which we had based our machine. He informed us that, in designing machinery, about 20 percent was usually allowed for the loss in the transmission of power. As we had allowed only five percent, a figure we had arrived at by some crude measurements of the friction of one of the chains when carrying only a very light load, we were much alarmed. More than the whole surplus in power allowed in our calculations would, accord to Mr. Chanute's estimate, be consumed in friction in the driving chains. After Mr. Chanute's departure we suspended one of the drive chains over a sprocket, hanging bags of sand on either side of sprocket of a weight approximately equal to the pull that would be exerted on the chains when driving the propellers. By measuring the extra amount of weight needed on one side to lift the weight the other, we calculated the loss in transmission. This indicated that the loss of power from this source would be only five percent, as we originally estimated. But while we could see no serious error in this method of determining the loss, we were very uneasy until we had a chance to run the propellers with the motor to see whether we could get the estimated number of turns.

The first run of the motor on the machine developed a flaw in one of the propeller shafts which had not been discovered in the test at Dayton. The shafts were sent at once to Dayton for repair and were not received again until November 20, having been gone two weeks. We immediately put them in the machine and made another test. A new trouble developed. The sprockets which were screwed on the shafts, and locked with nuts of opposite thread, persisted in coming loose. After many futile attempts to get them fast, we had to give it up and went to bed much discouraged. After a night's rest we got up in better spirits and resolved to try again.

While in the bicycle business we had become well acquainted with the use of hard tire cement for fastening tires on the rims. We had once used it successfully in repairing a stopwatch after several watchsmiths had told us it could not be repaired. If tire cement was good for fastening the hands on a stop watch, why should it not be good for fastening the sprockets on the propeller shaft of a flying machine? We decided to try it. We heated the shafts and sprockets, melted cement into the threads, and screwed them together again. This trouble was over. The sprockets stayed fast.

Just as the machine was ready for test, bad weather set in. It had been disagreeably cold for several weeks, so cold that we could scarcely work on the machine some days. But now we began to have rain and snow, and a wind of 25 to 30 miles blew for several days from the north. While we were being delayed by the weather we arranged a mechanism to measure automatically the durations of a flight from the time the machine started to move forward to the time it stopped, the distance travelled through the air in that time, and the number of revolutions made by the motor and propeller. A stopwatch took the time; an anemometer measured the air travelled through; and a counter took the number of revolutions made by the propellers. The watch, anemometer, and revolution counter were all automatically started and stopped simultaneously. From data thus obtained we expected to prove or disprove the accuracy of our propeller calculations.

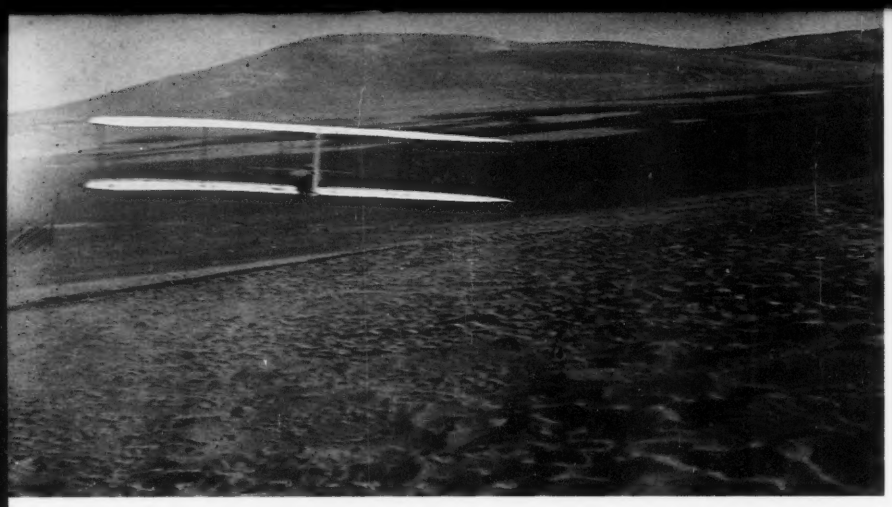
PROPELLER SHAFT TROUBLE

On November 28, while giving the motor a run indoors, we thought we again saw something wrong with one of the propeller shafts. On stopping the motor, we discovered that one of the tubular shafts had cracked!

Immediate preparation was made for returning to Dayton to build another set of shafts. We decided to abandon the use of tubes, as they did not afford enough spring to take up the shocks of premature or missed explosions of the motor. Solid tool-steel shafts of smaller diameter than the tubes previously used were decided upon. These would allow a certain amount of spring. The tubular shafts were many times stronger than would have been necessary to transmit the power of our motor if the strains upon them had been uniform. But the large hollow shafts had no spring in them to absorb the unequal strains.

Wilbur remained in camp while I went to get the new shafts. I did not get back to camp again till Friday, the 11th of December. Saturday afternoon the machine was again ready for trial, but the wind was so light, a start could not have been made from level ground with the run of only 60 feet permitted by our monorail track. Nor was there enough time before day to take the machine to one of the hills, where, by placing the track on a steep incline, sufficient speed could be secured for starting in calm air.

Monday, December 14th, was a beautiful day, but there was not enough wind to enable a start to be made from the level ground about camp. We therefore decided to attempt a flight from the side of the big Kill Devil Hill. We had arranged with the members of the Kill Devil Life Saving Station, which was located a little over a mile from our camp, to inform them when we were ready to make the first trial of the machine. We were soon joined by J.T. Daniels, Robert Westcott, Thomas Beacham, W.S. Dough, and Uncle Benny O'Neal, of the Station, who helped us get the machine to the hill, a quarter mile away. We laid the track 150 feet up the side of the hill on a nine degree slope. With the slope of the track, the thrust of the propellers, and the machine starting directly into the wind, we did not anticipate any trouble in



getting up flying speed on the 60-foot monorail track. But we did not feel certain the operator could keep the machine balanced on the track.

THE FIRST ATTEMPT

When the machine had been fastened with a wire to the track, so that it could not start until released by the operator, and the motor had been run to make sure that it was in condition, we tossed a coin to decide who should have the first trial. Wilbur won. I took a position at one of the wings intending to help balance the machine as it ran down the rack. But when the restraining wire was slipped, the machine started off so quickly I could stay with it only a few feet. After a 35- to 40-foot run, it lifted from the rail. But it was allowed to turn up too much. It climbed a few feet, stalled, and then settled to the ground near the foot of the hill, 105 feet below. My stopwatch showed that it had been in the air just 3 l/2 seconds. In landing the left wing touched first. The machine swung around, dug the skids into the sand and broke one of them. Several other parts were also broken, but the damage to the machine was not serious. While the test had shown nothing as to whether the power of the motor was sufficient to keep the machine up, since the landing was made many feet below the starting point, the experiment had demonstrated that the method adopted for launching the machine was a safe and practical one. On the whole, we were much pleased.

Two days were consumed in making repairs, and the machine was not ready again till late in the afternoon of the 16th. While we had it out on the track in front of the building, making the final adjustments, a stranger came along. After looking at the machine a few seconds he inquired what it was. When we told him it was a flying machine he asked whether we intended to fly it. We said we did, as soon as we had a suitable wind. He looked at it several minutes longer and then, wishing to be courteous, remarked that it looked as if it would fly, if it had a "suitable wind." We were much amused, for, no doubt, he had in mind the recent 75-mile gale when he repeated our words, "a suitable wind!"

During the night of December 16, 1903, a strong cold wind blew from the north. When we arose on the morning of the 17th, the puddles of water, which had been standing about the camp since the recent rains, were covered with ice. The wind had a velocity of 10 to 12 meters per second (22 to 27 miles an hour). We thought it would die down before long, and so remained indoors the early part of the morning. But when ten o'clock arrived, and the wind was as brisk as ever, we decided that we had better get the machine out and attempt a flight. We hung out the signal for the men of the Life Saving Station. We thought that by facing the flyer into a strong wind, there ought to be no trouble in launching it from the level ground about camp. We realized the difficulties of flying in so high a wind, but estimated that the added dangers in flight would be partly compensated for by the slower speed in landing.

FINAL PREPARATIONS

We laid the track on a smooth stretch of ground about 100 feet north of the new building. The biting cold wind made work difficult, and we had to warm up frequently in our living room, where we had a good fire in an improvised stove made of a large carbide can. By the time all was ready, J.T. Daniels, W.S. Dough and A.D. Etheridge, members of the Kill Devil Life Saving Station; W.C. Brinkley of Manteo, and Johnny Moore, a boy from Nags Head, had arrived.

We had a "Richard" hand anemometer with which we measured the velocity of the wind. Measurements made just before starting the first flight showed velocities of 11 to 12 meters per second, or 24 to 27 miles per hour. Measurements made just before the last flight gave between 9 and 10 meters per second. One made just after showed a little over eight meters. The records from the Government Weather Bureau at Kitty Hawk gave the velocity of the wind between the hours of 10:30 and 12 o'clock, the time during which the four flights were made, as averaging 27 miles at the time of the first flight and 24 miles at the time of the last.

AUDACITY—AND CALCULATION

With all the knowledge and skill acquired in thousands of flights in the last ten years, I would hardly think today of making my first flight on a strange machine in a twenty-seven mile wind, even if I knew that the machine had already been flown and was safe. After these years of experience I look with amazement upon our audacity in attempting flights with a new and untried machine under such circumstances. Yet faith in our calculations and the design of the first machine, based upon our tables of air pressures, secured by months of careful laboratory work, and confidence in our system of control developed by three years of actual experiences in

balancing gliders in the air had convinced us that the machine was capable of lifting and maintaining itself in the air, and that, with a little practice, it could be safely flown.

Wilbur, having used his turn in the unsuccessful attempt on the 14th, the right to the first trial now belonged to me. After running the motor a few minutes to heat it up, I released the wire that held the machine to the track, and the machine started forward in the wind. Wilbur ran at the side of the machine, holding the wing to balance it on the track. Unlike the start on the 14th, made in a calm, the machine, facing a 27-mile wind, started very slowly. Wilbur was able to stay with it till it lifted from the track after a 40-foot run. One of the Life Saving men snapped the camera for us, taking a picture just as the machine had reached the end of the track and had risen to a height of about two feet. The slow forward speed of the machine over the ground is clearly shown in the picture by Wilbur's attitude. He stayed along beside the machine without any effort.

FLIGHT

The course of the flight up and down was exceedingly erratic, partly due to the irregularity of the air, and partly to lack of experience in handling this machine. The control of the front rudder was difficult on account of its being balanced too near the center. This gave it a tendency to turn itself when started; so that it turned too far on one side and then too far on the other. As a result the machine would rise suddenly to about ten feet, and then as suddenly dart for the ground. A sudden dart when a little over a hundred feet from the end of the track, or a little over 120 feet from the point at which it rose into the air, ended the flight. As the velocity of the wind was over 35 feet per second and the speed of the machine over the ground against this wind ten feet per second, the speed of the machine relative to the air was over 45 feet per second, and the length of the flight was equivalent to a flight of 540 feet made in calm air. This flight lasted only 12 seconds, but it was nevertheless the first in the history of the world in which a machine carrying a man had raised itself by its own power into the air in full flight, had sailed forward without reduction of speed and had finally landed at a point as high as that from which it started.

With the assistance of our visitors we carried the machine back to the track and prepared for another flight. The wind, however, had chilled us all through, so that before attempting a second flight, we all went to the building again to warm up. Johnny Ward, seeing under the table a box filled with eggs, asked one of the Station men where we got so many of them. The people of the neighborhood eke out a bare existence by catching fish during the short fishing season, and their supplies of other articles of food are limited. He had probably never seen so many eggs at one time in his whole life. The one addressed jokingly asked him whether he hadn't noticed the small hen running about the outside of the building. "That chicken lays eight to ten eggs a day!" Ward, having just seen a piece of machinery lift itself from the ground and fly, a thing at that time considered as impossible as perpetual motion, was ready to believe nearly anything. But after going out and having a good look at the wonderful fowl, he returned with the remark, "It's only a common looking chicken!"

SECOND AND THIRD FLIGHTS

At twenty minutes after eleven Wilbur started on the second flight. The course of this flight was much like that of the first, very much up and down. The speed over the ground was somewhat faster than that of the first flight, due to the lesser wind. The duration of the flight was less than a second longer than the first, but the distance covered was about seventy-five feet greater.

Twenty minutes later the third flight started. This one was steadier than the first one an hour before. I was proceeding along pretty well when a sudden gust from the right lifted the machine up 12 to 15 feet and turned it up sidewise in an alarming manner. It began a lively sidling off to the left. I warped the wings to try to recover the lateral balance and at the same time pointed the machine down to reach the ground as quickly as possible. The lateral control was more effective than I had imagined and before I reached the ground the right wing was lower than the left and struck first. The time of this flight was 15 seconds and the distance over the ground a little over 200 feet.

Wilbur started the fourth and last flight at just 12 o'clock. The first few hundred feet were up and down, as before, but by the time 300 feet had been covered, the machine was under much better control. The course of the next four or five hundred feet had but little undulation. However, when out about 800 feet the machine began pitching again, and, in one of the its darts downward, struck the ground. The distance over the ground was measured and found to be 852 feet; the time of the flight 59 seconds. The frame supporting the front rudder was badly broken, but the main part of the machine was not injured at all. We estimated that the machine could be put in condition for flight again in a day or two.

While we were standing about discussing this last flight, a sudden strong gust of wind struck the machine and began to turn it over. Everybody made a rush for it. Wilbur, who was at one end, seized it in front. Mr. Daniels and I, who were behind, tried to stop it by holding to the rear uprights. All our efforts were in vain. The machine rolled over and over. Daniels, who had retained his grip, was carried along with it, and was thrown about head over heels inside of the machine. Fortunately he was not seriously injured, though badly bruised in falling about against the motor, chain guides, etc. The ribs in the surface of the machine were broken, the motor injured and the chain guides badly bent, so that all possibility of further flights with it for that year were at an end.

IACRA... AT LAST!

by Dave Fosdick
and Tim Matzell

This is part of the IACRA Team that made the process possible. Elizabeth Cody, Ray Lewallen, Larry Hilderbrand, Carol Thornton, Nancy Owens, and Josh Myers.

The Integrated Airman Certification and/or Rating Application (IACRA) software is now authorized for use on the Internet as a major enhancement to the airman certification process.

Most of us used the traditional, "manual" method of obtaining a pilot's certificate. You brought a hard copy of the Airman Certificate and/or Rating Application (FAA Form 8710-1) with you to the practical test. After you passed the test, the examiner issued you a temporary certificate and mailed the application to the Civil Aviation Registry in Oklahoma City. However, if an error was found, the entire file was mailed back to the Flight Standards District Office. Once the correction was made, it was returned to the Civil Aviation Registry for re-examination. The process could take up to 120 days before you received your certificate in the mail.

In the early 1990's, the FAA developed the Airman Certification and/or Rating Application (ACRA) process and provided a CD to Flight Standards District Offices (FSDO) and Designated Pilot Examiners (DPE). It is a computer program that processes applications for airmen certification and ratings, checks to ensure that regulatory and policy requirements are met, and produces certification documents, such as a temporary certificate. The examiner enters the information into the ACRA program after you arrive for the practical test. The ACRA program validates the flight hours against the Federal aviation regulations and determines if your medical and knowledge test results are current.

Many Aviation Safety Inspectors, Aviation Safety Technicians, and Designated Examiners have used the stand-alone ACRA CD for many years. ACRA is an improvement over the traditional method, but the hard copy application and attachments must still be mailed to Oklahoma City

Why was IACRA Developed?

IACRA is different from ACRA in that it's web based. You don't have to install or download any software to get the same functionality as you did with ACRA. In fact, IACRA has the following advantages:

- You can access it anywhere you have an Internet connection.
- A single tracking number is permanently assigned to each airman.
- Your time to complete an application is reduced by using online data entry.
- Your input data is auto-checked to reduce potential errors and the number of rejected applications.
- Digital signatures ensure that data is captured, wrapped, archived, and the signature is validated as required.
- The overall certification process time is significantly reduced.
- The uniform interpretation of airman certification regulations automatically ensures that the applicant meets regulatory and policy requirements.

The new IACRA web-based version uses digital signature, which allows electronic transfer of the airman application to the Registry. An applicant, recommending instructor, and examiner can complete the application on the IACRA web site. The recommending instructor may digitally sign the recommendation before the day of the practical test. The applicant and the examiner digitally sign the application, and after the practical test forward it electronically to Oklahoma City.

IACRA uses "roles" to determine the level of access a person has to the system. For example, an individual can select "Applicant," "Recommending Instructor," or "Certifying Officer." A certifying officer is an Aviation Safety Inspector, an Aviation Safety Technician, or a Designated Examiner. Except for new applicants, IACRA validates individuals by their FAA certificates. Each time a person chooses a role and registers, the information is verified against various FAA databases to determine currency.

IACRA is one of the first programs to satisfy the Government Paperwork Elimination Act. It is an option that saves time and assures compliance with airman certification regulations.

Dave Fosdick is the IACRA Program Manager in the General Aviation and Commercial Division, Washington, DC and Tim Matzell is a Technical Writer for Titan Corporation, Oklahoma

IACRA Rollout Schedule

We will roll out IACRA region by region based on the following schedule:

Southern	September 2003
Southwest	November 2003
Great Lakes	February 2004
W. Pacific	April 2004
Eastern	June 2004
NW. Mountain	August 2004
Central	October 2004
New England	November 2004
Alaska	December 2004

RUNWAY SAFETY CORNER

The following information comes from Advisory Circular 91-73, Part 91 Pilot and Flight Crew Procedures during Taxi Operations and Part 135 Single-pilot Operations. *This advisory circular provides guidelines for the development and implementation of standard pilot procedures for conducting safe aircraft operations on the airport surface. It focuses on the activities occurring on the flight deck/cockpit (e.g., planning, communicating, coordinating), as opposed to the actual control of the aircraft (e.g., climbing, descending, maneuvering). Although there are many similarities, taxi operations for single piloted aircraft, as opposed to taxi operations for aircraft that require more than one pilot, present distinct challenges and requirements.*

Over the next several issues, we will be presenting portions of this advisory circular. This section reproduces the ten best practices recommended for runway incursion prevention.

Runway Incursion Prevention Best Practices

1. Read back all runway crossing and/or hold short instructions;

2. Review airport layouts as part of preflight planning and before descending to land, and while taxiing as needed;

3. Know airport signage;

4. Review Notices to Airmen (NOTAM) for information on runway/taxiway closures and construction areas;

5. Do not hesitate to request progressive taxi instructions from ATC when unsure of the taxi route;

6. Check for traffic before crossing any Runway Hold Line and before entering a taxiway;

7. Turn on aircraft lights and rotating beacon or strobe lights while taxiing;

8. When landing, clear the active runway as quickly as possible then wait for taxi instructions before further movement;

9. Study and use proper radio phraseology as described in the *Aeronautical Information Manual* in order to respond to and understand ground control instructions;

10. Write down complex taxi instructions at unfamiliar airports.

To obtain the advisory circular in its entirety, it and other advisory circulars on runway safety can be found at <http://www.faarsp.org/cockpit.html>.

• FAA DC3, N34 News

Great article and may improve the public's ideas of the things the FAA does, especially for general aviation.

However, there are some discrepancies in the aircraft and story. I believe this airframe was only used for pilot ratings and proficiency training, as I believe was N500 and N400. Two things that I noticed were missing in its present form was the flight inspection radar nose with the white cross showing just in front of the internal glide slope antenna and the panoramic windows forward on each side adjacent to the electronic panel operators' station. (See photo) One thing I could not determine was if the rudder had both a trim tab and an anti-servo tab (required on the R-1830-94 powered airplanes used by Flight Inspection).

The overhaul shops at the FAA Academy in Oklahoma City, OK, changed around the "N" numbers every now and then. There is no information as to whether the flight inspection electronic recording station was installed in the aircraft! Additional information is available in Scott A. Thompson's book, *Flight Check!, The Story of FAA Flight Inspection*, AVN Group – Oklahoma City.

Great work and keep it up to show the public and especially general aviation of some the good things the FAA does.

Thanks you for the memories.

Ervin J. Gallagher
FAA retired
Cobb, CA

Thanks for sharing the information. Others have fond memories of the DC3.

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to H. Dean Chamberlain, Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address:

Dean.Chamberlain@faa.gov

• Shall versus Should

I enjoy reading the *FAA Aviation News*. I think you do a great job with this publication.

The reason that I am writing is an article that you published in the September/October issue, "How Low Can I Go?" This article proposes that it is okay to operate down at CAT A minimums when you are maintaining CAT B, C. or D speeds during the circling approach. This goes against all current training and checking philosophy, as well as the guidance in the *Aeronautical Information Manual* (AIM). Even though the AIM or an advisory circular is not regulatory, it usually represents a compilation of best practices or a suggested method of compliance. When choosing an alternative method of compliance, the burden to show an equivalent level of safety is on the operator. Since operating at a higher speed than the speed attached to the MDA you are at, could result in a loss of intended obstacle clearance, I am confident that FAA legal would find that technique not consistent with

the safe operation of the aircraft. So, even though you might not be operating contrary to Title 14 Code of Federal Regulations 14 CFR) Part 97, section 91.13 of 14 CFR Part 91 would apply. Personally, I would pursue a violation under Section 91.13 against any pilot who operated in that manner.

The reason that this concerns me is that this magazine is commonly found in FBO's and around flight schools, and since it is an "FAA publication," it is taken as gospel. I strongly believe that we should print a clarification to this article so that the general public will not end up with the wrong impression.

Bob Maynard
Aviation Safety Inspector
Atlanta FSDO

Thanks for your message. The basis for the article was the FAA's use of the word "should" rather than a mandatory "shall" when discussing approach categories and approach speeds in the U.S. Terminal Procedures. The intent of the article was to remind people that they should operate at the appropriate higher minimums when flying at a speed above their normal approach speed. We are not advocating that anyone operate at lower minimums when flying at a higher approach airspeed. As you pointed out, this can be very dangerous. The AIM may change its wording to reflect the need to use the appropriate minimums for a given approach speed.

ELT RULE CHANGE EFFECTIVE JANUARY 1

If you own or fly a small business turbojet-powered airplane, your aircraft may become subject to a change in the emergency locator transmitter (ELT) regulation that becomes effective on January 1, 2004. As a result of a 2000 change in the regulation, 14 Code of Federal Regulations §91.207, Emergency locator transmitters, turbojet-powered airplanes become subject to the ELT carriage requirement on January 1, unless the airplane meets one of the 11 conditions listed in the rule that excepts it from the carriage requirement.

The rule change included a new exception that states, "On and after January 1, 2004, aircraft with a maximum payload capacity of more than 18,000 pounds when used in air transportation."

FITS UPDATE

FAA/Industry Training Standards (FITS) is the modernized, pro-active FAA approach to match its general aviation policies and procedures with new aircraft, new avionics, and new flight technologies. Since the three part article on FITS was published in the *FAA Aviation News* (March/April, May/June, and July/August 2003), the FITS team has produced several new products and is working hard on many more. FITS has accepted the Garmin 430/530 Training Syllabus and the Technically Advanced Aircraft (TAA) Transition Training Syllabus. The FAA has published interim guidance to Designated Pilot Examiners on giving practical tests in TAAs. Also completed are a TAA Safety Study and the Personal and Weather Risk Assessment Guide. All of these documents can be accessed on the FITS web site <www.faa.gov/avr/afs/fits>. To quickly find these document, click on "What's New." (New documents will be under "What's New" for about six months.)

Finally, the FITS Oversight Committee has increased its membership in the last few months. Members now include: Avemco, Cessna, Electronic Flight Solutions, Frasca, Jeppesen, Global Aerospace, King Schools, and the National Business Aircraft Association.

FAA RULE WILL INCREASE HIGH-ALTITUDE CAPACITY

On October 22, the FAA issued a new rule affecting Title 14 Code of Federal Regulations parts 11 and 91. It will significantly increase capacity and operating efficiency at high altitudes. The rule reduces the minimum vertical separation between aircraft from the current 2,000 feet to 1,000 feet for all aircraft flying between 29,000 feet and 41,000 feet (FL290 and 410). Implementation of the Reduced Vertical Separation Minimum (RVSM) on January 20, 2005, will significantly increase the routes and altitudes available and thus allow more efficient routings that will save time and fuel.

"This rule offers a combination of greater aviation safety, capacity, and cost efficiency," said FAA Administrator Marion C. Blakey. "RVSM positions the country's high-altitude airspace to meet future demand."

"Implementing RVSM is an important initiative within the FAA's strategic five-year Flight Plan to increase capacity," said Blakey. "RVSM aids the agency's goal to improve global aviation harmonization."

RVSM is already in effect in Europe and Australia and over most of the North Atlantic and Pacific oceans. Canada plans to implement RVSM in its southern airspace (it's already in effect north of 57 degrees latitude) at the same time as the United States. Caribbean and South American countries also plan to join the U.S. and Canada in implementing RVSM in 2005.

The benefits from RVSM go beyond just time and fuel efficiency. RVSM offers greater flexibility for air traffic controllers and reduces their workload. This flexibility is particularly useful when controllers have to reroute flights around bad weather. More available routes and altitudes mean greater separation between aircraft, and controllers will have more options to separate aircraft on intersecting routes.

The FAA is implementing RVSM in January 2005 to give airlines and other aircraft operators time to install the more accurate altimeters and autopilot systems needed to ensure the highest level of safety. The estimated fuel savings of $5.3 billion through 2016 far exceed the estimated cost of over $800 million to modify aircraft to meet RVSM standards.

The final rule, Reduced Vertical Separation Minimum in Domestic U.S. Airspace, can be found at <www.faa.gov/avr/arm/nprm.cfm?nav=nprm>.

NEW AIRPORT SURVEILLANCE RADAR READY FOR NATIONAL DEPLOYMENT

The FAA announced on October 21 the nationwide deployment of the first all-digital airport radar system. The Airport Surveillance Radar (ASR)-11 will replace older-generation analog radars that are nearing the end of their service life.

"Digital radar is a critical component of a modernized airspace system," said FAA Administrator Marion C. Blakey. "The ASR-11 feeds more data more reliably to air traffic control for greater safety and efficiency."

The ASR-11 provides improved

digital aircraft and weather input needed by the FAA's new air traffic control automation systems, such as STARS (Standard Terminal Automation Replacement System). The first ASR-11 went operational in March at the Willow Grove, PA, Naval Air Station, and has been providing radar data to STARS at the Philadelphia International Airport.

The ASR-11 is a joint FAA/ Department of Defense program. The FAA plans to procure a total of 112 ASR-11s from Raytheon of Lexington, MA, with scheduled deployment completed in 2009. The FAA has procured 25 systems since the contract was awarded in December 1996.

TRANSPORTATION FATALITIES INCREASE IN 2002

Transportation fatalities in the U.S. increased slightly in 2002, according to preliminary figures released by the National Transportation Safety Board (NTSB). Deaths from transportation accidents in the U.S. in 2002 totaled 45,098, up from the 44,969 fatalities in 2001. The accompanying table and pie chart that shows the number of transportation related fatalities for each mode of transportation are available on the Board's web site at <www.ntsb.gov>.

Highway fatalities, accounting for more than 94 percent of the transportation deaths in 2002, increased from 42,196 in 2001 to 42,815 in 2002. The number of fatalities increased in most highway vehicle categories; however, a decrease in deaths occurred in the category of medium and heavy trucks, which recorded 24 fewer fatalities in 2002 than in 2001.

The number of persons killed in all aviation accidents dropped from 1,171 in 2001 to 618 in 2002. It should be noted that airline fatalities in 2001 accounted for a total of 531 deaths. The 2001 deaths included the September 11 terrorist attacks and the American Airlines flight 587 crash in November. There were no fatalities on scheduled passenger carriers in 2002. The number of general aviation fatalities increased slightly from 562 in 2001 to 576 in 2002.

Total rail fatalities increased in 2002 to 603 from 597, reflecting a rise in pedestrian fatalities associated with intercity rail operations. Seven rail passengers were killed in 2002, compared to 3 in 2001. Fatalities occurring on light rail, heavy rail, and commuter rail increased from 197 to 220. (Because of peculiarities in reporting requirements, there may be some duplication in the numbers for intercity rail and commuter rail on the accompanying chart.)

Marine deaths increased from 772 to 793. Recreational boating fatalities, the largest category of marine deaths, increased from 681 to 750. Fatalities declined in marine cargo transportation, commercial fishing and commercial passenger operations.

Pipeline fatalities increased slightly from 7 to 11, 10 of them related to gas pipelines and one to liquid pipeline operations.

Aviation statistics are compiled by the NTSB. Numbers for all other modes are from the Department of Transportation.

SAFETY REQUIREMENTS FOR FRACTIONALLY OWNED AIRCRAFT

On September 17, the FAA published in the *Federal Register* the final rule, which updated its requirements for the safety and compliance of operations by fractionally owned aircraft.

Under today's commercially available fractional aircraft ownership programs, which have existed since 1986, an individual or organization purchases partial ownership of at least one aircraft in a pool of aircraft and then is able to use aircraft from the pool as needed. Previously, these programs were regulated as general aviation or private, non-commercial flying. As the fractional ownership programs grew in size and complexity, the FAA and the aviation community identified a need for a more appropriate regulatory structure with corresponding safety standards for these unique arrangements.

The FAA updated and revised its regulations for fractional ownership programs because previous regulations did not adequately define these programs and did not clearly allocate responsibility and authority for safety and compliance with FAA regulations.

The final rule adds Subpart K to Title 14 Code of Federal Regulations part 91 and defines fractional ownership programs and their various participants, allocates responsibility and authority for safety of flight operations, and ensures that fractionally owned aircraft are operated at a high level of safety.

"The FAA is keeping pace and adapting to an ever-changing aviation industry," said FAA Administrator Marion C. Blakey. "This rule ensures that robust safety oversight is given to one of the fastest growing segments of the aviation industry."

In October 1999, the FAA established the Fractional Ownership Aviation Rulemaking Committee (FOARC), consisting of industry and government representatives, to recommend and draft rule language to the FAA to regulate fractional ownership programs as a specific subset under General Aviation operations.

The agency published a Notice of Proposed Rulemaking (NPRM) in July 2001 that substantially incorporated the committee's recommendations. The final rule, Regulation of Fractional Aircraft Ownership Programs and On-demand Operations, can be found at <www.faa.gov/avr/arm/nprm.cfm?nav=nprm>.

Editor's Runway

from the pen of H. Dean Chamberlain

Orville Wright

A MOMENT IN TIME

Wilbur Wright

During the week of October 13, I watched a TV news program discussing a gene that might contribute to a person's longevity. In the news segment, three siblings, each near 100 years old or older were shown. All three looked in great condition. What amazed me about the three was not that they had lived so long, but that their lives had spanned the history of powered, heavier-than-air flight, as we know it today. Since this issue of the magazine is being sent to support the FAA's efforts at the 100th anniversary celebration of the Wright brother's December 17, 1903, flight, at Kitty Hawk, North Carolina, I thought it amazing that there are people alive today who were born before that historic first flight on a cold North Carolina day.

As we celebrate the work of those three men from Ohio, Orville and Wilbur Wright and Charles Taylor, the machinist who made their first engine, I think it appropriate that all of us who love aviation and what it has meant to so many people should stop and think for a moment what changes someone born in December 2003 will see if that person lives until 2103. And based upon current medical predictions, many people will routinely live to be 100 years old or older by then. What will their lives be like and how will their lives be impacted by aviation? Will aviation as we know it today even exist then? Only time will tell.

In the last 100 years, we went from the wind-swept sand dunes of the Outer Banks of North Carolina and the fields of Ohio where flight time was measured in seconds and distance measured in feet to supersonic long-range flight and space flight to the moon and back. During this month of October, history was made as China launched its first person into earth orbit while the British supersonic *Concord* airplane is scheduled to make its last flight by the end of the month. In a related television interview this week, a woman said she had spent part of her retirement money to buy a ticket on one of the last scheduled flights of the *Concord*. In the excitement of telling her story after the flight, she said the flight made her feel like a seven-year old again.

The question is how many other people would be willing to spend thousands of dollars for a supersonic flight across the Atlantic? How many other people still think such a flight would make them feel like a child again with all of the wonderment that a child brings to life. In retrospect, the cost of her ticket seems insignificant to the joy she shared with those of us who saw her interview. For her and countless others, aviation is still magical.

Maybe, as we enter the next century of flight, we should all pause for a moment on December 17 at 10:35 a.m. and give thanks to those men from Ohio and to all of the other men and women who have contributed to the wonderment we call aviation. And, maybe one day, if we are lucky, we too shall feel like a seven-year old on a flight. A flight we can remember for the rest of our lives.

Thanks guys for showing us how to fly. Happy Anniversary.

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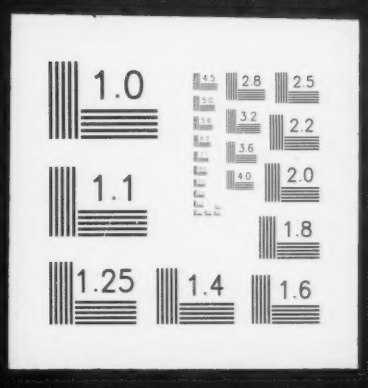
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